

# The Power of KNOWLEDGE

A Mini ENCYCLOPEDIA



Paudel Nigam

'A book beyond the textbook'

**The Power of KNOWLEDGE:**  
**A Mini ENCYCLOPEDIA**

**First Edition**

**Paudel Nigam**

**Team NEPO**

**Butwal | Kathmandu | Pokhara**  
**Nepal**

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## FOREWORD

It is my pleasure to write the foreword of this book. I found '**The Power of KNOWLEDGE: A Mini Encyclopedia**' by Nigam Paudel is very useful to all types of readers especially interested in General Knowledge and the students from various backgrounds preparing for different posts in *Lok Sewa* (Public Service Commission), Nepal. The first chapter starts with characters of English literature and remaining thirteen chapters cover basic science, sports, music, religion, human health, international personalities and organizations.

I believe that this book would be immensely helpful to the young energetic students to sharpen their minds. It is the collection of recent information in the fields of Culture, History, and Geography of Nepal as well as on the scientific development worldwide.

Though, it is the first step of the writer but work looks very mature, full of exciting collection and information. I hope this would serve as one of the best collections in General Knowledge.



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May 15, 2016



ॐ

मानव चेतनाको विकासको क्रम निरन्तर गतिशील छ । त्यस क्रममा वेद-वेदाङ्गबाट प्रारम्भ भएको ज्ञान-विज्ञान आज अथाह सागर बन्न पुगेको छ । अतीतका सीमित आवश्यकताका लागि पर्याप्त भएको ज्ञान आजको मानव-समाजका असीम आवश्यकताको सन्दर्भमा अपुग भएर नै वर्तमान शताब्दीको ज्ञान-विज्ञान उच्चतम अवस्थातिर लम्कदैछ । यसका राम्रा-नराम्रा सबै पक्षहरु भएपनि यसको सदुपयोगबाट वर्तमान समयमा बढीभन्दा बढी मानिस तथा देशहरु लाभान्वित भइरहेकाछन् र भविष्यमा पनि हुने नै छन् ।

चेतनाको विकासका लागि ज्ञान-विज्ञान अपरिहार्य छ । तर जीवनमा सफलताका लागि सबै विषयको सम्पूर्ण ज्ञान सम्भव छैन । जीवनमा उन्नति गर्नका लागि अत्यावश्यक ज्ञान लिन पहिले ज्ञान विज्ञानको समुद्रमा पस्नुपर्ने त्यसपछि त्यहाँबाट मोती-मूंगा बटुल्न पर्ने हुन्छ । समुद्रमा पस्ने साहस अनि मोती-मूंगा नभेटिन्जेल चाहिने लगन तथा धैर्य नभई सफलता पाइन्न ।

जीवनोपयोगी महत्वपूर्ण ज्ञानको सामग्री वर्तमान समयमा सामान्य ज्ञान नामले प्रचलित छ जसमा ज्ञानका सबै विधाहरु समेट्ने गरिन्छ । त्यसमा पनि व्यक्तिको रुचि, कार्यक्षेत्र आदिको विचार गर्दा सबैका लागि एकै ढाँचाको सामग्री त्यति उपयोगी हुँदैन । कसैका लागि साहित्यसम्बन्धी विषय बढी महत्वको हुनसक्छ, कसैलाई विज्ञानको विषय । अहिले सामान्य ज्ञानको नामबाट एकसे एक पुस्तकहरु प्रकाशित भइरहेकाछन्, ती सबै अरु विषयहरुतिर बढी झुकेकाछन्, तिनमा विज्ञानसम्बन्धी सामग्री त्यति पाइन्न ।

यस सन्दर्भमा नवोदित लेखक भाई निगम पौडेलको 'दी पावर अफ नालेज: अ मिनी इन्साइक्लोपीडिया' पुस्तक प्रकाशन हुन लागेको थाहा पाएँ । उक्त पुस्तक सरसर्ती हेर्दा त्यसमा अंग्रेजी भाषा-साहित्य, भौतिकशास्त्र, रसायनशास्त्र, जीवविज्ञान, भूगोल, जनसंख्या, राजनीति, खेलहरु, इतिहास, संगीत, मनोरञ्जन, शिक्षा, कला, धर्म-संस्कृति, भाषा-साहित्य, राष्ट्रिय-अन्तराष्ट्रिय व्यक्तित्वहरु तथा अन्तराष्ट्रिय संगठन यी शीर्षक अन्तर्गतका विषयहरु सरल, सुगम भै व्यापक सामग्रीका साथ प्रस्तुत गरेको पाएँ र यसका लागि भाईलाई बधाईसहित धन्यवाद ज्ञापन गर्दछु । यो पुस्तक सबै पाठकहरुका लागि पठनीय र अति उपयोगी छ । लेखकको यस किसिमको उच्चमी प्रयास निरन्तर कायम भैरहोस् र सम्पूर्ण जिज्ञासु पाठकवर्गको ज्ञानको अभिलाषा पूर्ण भईरहोस् भनी शुभेच्छा व्यक्त गर्दछु ।

२०७३/०९/२९



डा. काशीराज सुवेदी

उपप्राध्यापक

आयुर्वेद क्याम्पस,

त्रि. वि., कीर्तिपुर ।



## PREFACE

These days are being as the days of competition; a student must take a great responsibility to be a strong competitor either in their own educational career or in any other competition. In this age of information, every student and children must be well acquainted with the world around them. Most of the students are compelled to depend only upon their text books because the teaching and learning activities at many schools and colleges of our nation highly depend on textbook only. No doubt, the latest information is the matter of concern for everyone but at the same time it should also be remembered that the knowledge is somewhat different from the information. The aim of education should not cease at the collection of information only but it should be devoted in search of the reality. Seeing this awkward circumstance in development of a skillful, obedient and globally competent citizen, I have tried my best to bring out this reference material with an aim to foster the student's confidence, potentiality and the knowledge.

This book has been specially designed emphasizing the secondary and higher secondary level students. Moreover it is also useful for the open learners, readers and public in general; those who are preparing for any loksewa exam or other competition. Lots of things are incorporated within this book which every student needs to refer at some point of time or other. It is basically meant to be used as a reference material. But, the most special feature of this book is, it uses the base of text books to each chapters and reaches to the standard of an encyclopedia. Each chapters of this book are well defined and managed with different sub topics for better comprehension. Besides, the questionnaire section of each chapter will certainly enhance students quiz capacity. I hope this edition will make every students curious and interest towards their study.

Finally, I will be happy enough if it creates even a small ripple in encouraging students. Despite my sincere efforts there might be some shortcomings in subject matters, language and graphics. So, any comments, constructive suggestions or criticisms are gratefully acknowledged.

Start by doing what is necessary then do what's possible and suddenly you are doing the impossible. Commit it to memory, example is a good lesson that every man can learn from.

God bless!

Paudel Nigam  
25<sup>th</sup> Dec, 2015



## ACKNOWLEDGEMENT

It is the matter of my great satisfaction that attempted me to present this book holding a different idea to study for the students. Publishing this book has made me gain more experience to accumulate the authentic materials required. I apologize for any omission here, and would be appreciative to hear from the readers and students with rectification and other suggestions.

First of all, I am infinitely grateful to my dad; **Ganesh Raj Paudel** and my mum; Nirmala Paudel for allowing me to follow my ambitions throughout my childhood and my brother Neetish Paudel for always being there with me. I remain indebted to **Prof. Dr. Mohan Panthi** and **Dr. Kashiraj Subedi** for the inspirational words which made me strong to believe in myself; **Dr. Krishna Raj Adhikari**, for his guidance and support in bringing out this book in this form. I would like to express my sincere gratitude to my respected teachers; Prof. Dr. DB Roka, Prof. Ratish Jha, Dr. Mithilesh Shah, Mr. Tikaram Nyoupane, Mr. Surendra Shakya, Mr. Bharat Pathak, Mr. Ganapat Chaudhary, Mr. Govinda Akela, Mr. Padam Shekhar Bhatt, Dan Bahadur Thapa, Bidhya Sagar Jha, Navendu Dhakal, Dipak Thapa, Janak Panthi and Pravin Kumar Jha. I can never forget Sanju Karki, Suraj Bhusal, Sagar Raj Popular, Subash Acharya and Tejash Shrestha for always being by my side.

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Author

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### A. One Word Substitution:

1. **Acquire** : to gain something by your own efforts, ability or behavior
2. **Alimony** : properties given to a divorced wife
3. **Alumni** : an ex-student of an institution
4. **Amnesia** : partial loss of memory
5. **Amnesty** : an excuse given to a political prisoner
6. **Anniversary** : the day celebrate an event every year
7. **Anonymous** : a writing whose writer is not known
8. **Anthropology** : the science of development of mankind
9. **Antidote** : a medicine that destroys the effect of poison
10. **Arsenal** : a place where weapons are kept in barracks
11. **Atheist** : one who does not believe in god
12. **Audience** : a large assembly of hearers
13. **Auditor** : a person who checks up the accounts
14. **Autobiography** : the life history of a person written by himself
15. **Babble** : the sound of many people speaking at the same time
16. **Bachelor** : an unmarried boy
17. **Bald** : having little or no hair on the head
18. **Bankrupt** : financially ruined one who is unable to pay the debt
19. **Barrack** : a place where solders live
20. **Bellicose** : a person who is fond of fighting
21. **Biennial** : that which happens after every two years
22. **Bigamy** : the practice of having two wives
23. **Bouquet** : a bunch of flowers arranged in an attractive way
24. **Burglar** : one who breaks in a house to steal
25. **Buzz** : to make a continuous low sound
26. **Byte** : a unit of information stored in a computer equal to 8 bits
27. **Calligraphy** : art of beautiful hand writing
28. **Cannibal** : the creatures that eat human flesh
29. **Carcass** : a dead body of an animal
30. **Casino** : a place to play gambling games for money
31. **Catalogue** : a list of goods, books etc
32. **Celibacy** : a state of being unmarried

33. **Cemetery** : an area of land used for burying dead people
34. **Chauffeur** : a person who is a professional driver
35. **Childish** : behaving in a stupid or silly way; foolish
36. **Childlike** : having the qualities that children usually have
37. **Colleague** : a person of the same rank, status or position
38. **Congregation** : a group of people in a temple or church
39. **Contagious** : a disease that spreads by touch
40. **Contemporary** : existing at the same moment
41. **Coquette** : a woman who behaves in a way that intended to attract men in love
42. **Corpse** : a dead body of a human
43. **Cremate** : to burn a dead body, especially as a part of funeral ceremony
44. **Crusade** : a religious war
45. **Custody** : an act of taking care of sth/sb
46. **Dawn** : the time of day when light first appears
47. **Daze** : a state of confusion
48. **Dead language** : a language which is no longer in use
49. **Democracy** : a government by the representation of the people
50. **Dermatology** : study of skin
51. **Dew** : the small drops of water formed on ground at night
52. **Dockyard** : a place where ships are built
53. **Dweller** : a person or animal that lives in a particular place
54. **Effeminate** : a man who is womanish in his habits
55. **Eligible** : fit for the post
56. **Elite** : a group of intellectual personalities in a society
57. **Emigrant** : a person who left his country to settle in another
58. **Encyclopedia** : the book of the knowledge and information
59. **Enthusiastic** : feeling a lot of excitement and interest about sb/sth
60. **Erotophobia** : fear of sexual love
61. **Ethology** : study of behavior of animals
62. **Extempore speech** : a speech delivered without preparation
63. **Fastidious** : a nature different to please
64. **Fib** : a statement that is not true
65. **Foe** : an enemy
66. **Fuss** : unnecessary excitement and worry



#### 4 | English

67. **Gaga** : confused and not able to think clearly
68. **Generous** : a person who gives away a lot of money
69. **Glimpse** : a look at somebody for a very short time
70. **Glutton** : a person who eats too much
71. **Gullible** : a person who easily believes others
72. **Gymnasium** : a building for practicing exercise
73. **Henpecked** : a man ruled by his wife
74. **Hepatology** : study of liver
75. **Homicide** : murder of human being
76. **Honorary office** : an office for which no salary is paid
77. **Hospitable** : treating guests well
78. **Hurt** : to cause physical pain to yourself
79. **Illegible** : that which cannot be read easily
80. **Illusion** : a false idea or belief
81. **Immigrant** : one coming to a foreign country to settle here
82. **Indolent** : one who is very lazy, not wanting to work
83. **Inevitable** : that you can't avoid or prevent
84. **Infallible** : one who cannot make any mistake
85. **Innocent** : one who is not guilty
86. **Irrevocable** : that can't be changed
87. **Issue** : an important topic to discuss
88. **Jaunt** : a short journey for pleasure
89. **Journey** : an act of travelling from one place to another
90. **Judas** : a person who treats a friend badly by not being loyal
91. **Kalology** : study of beauty
92. **Kith** : friends and relatives
93. **Knuckle** : any of the joints in the fingers
94. **Launderer** : a person who washes clothes
95. **Linguist** : a scholar of many languages
96. **Lullaby** : a song to put babies to sleep
97. **Lunar** : pertaining to the moon
98. **Lyricist** : a person who writes the words of songs
99. **Manuscript** : a hand written document
100. **Mercenary** : one who fights for money being a soldier

101. **Monarchy** : the government by a king
102. **Monogamy** : the practice of having one wife only
103. **Monotheist** : a person who believes in one god
104. **Mourners** : a group of people attending funeral
105. **Namesake** : one who has same name with another
106. **Ninny** : a stupid person
107. **Obsolete** : that which is not used now a days
108. **Octogenarian** : one who is eighty years old
109. **Omnipotent** : all powerful, having infinite power
110. **Omniscient** : one who knows everything
111. **Ophthalmologist** : one who attends to eye diseases
112. **Optimist** : a person who is hopeful to life
113. **Palmistry** : the science of reading palms
114. **Patricide** : murder of one's father
115. **Patriot** : a man who loves his own country
116. **Pessimist** : a person who is hopeless
117. **Pick-pocket** : one who steals from other's pocket
118. **Polyandry** : the practice of having many husbands
119. **Posthumous child** : a child born after the death of its father
120. **Referendum** : a decision made by 2-3<sup>rd</sup> majority
121. **Republic** : a government by representatives of the people
122. **Skeptical** : a person who usually doubts that claims or statements are true
123. **Spectators** : a group of people at match
124. **Spendthrift** : one who spends money recklessly
125. **Spinster** : an unmarried woman
126. **Tackle** : to make a determined effort to deal with a difficult problem or situation
127. **Trace** : to discover or find sth by looking carefully for it
128. **Uxorious** : one who loves his wife too much
129. **Vain** : a person who has a high opinion of himself
130. **Vendetta** : a dispute quarrel among family members
131. **Versatile** : a multi talented person
132. **Veteran** : a well experienced person
133. **Widower** : a man whose wife has died
134. **Witless** : silly or stupid; not sensible
135. **Zit** : a spot on the skin especially on the face

## B. Appropriate Terms for Collections

A troupe of actors, artists	A bunch of keys
A council of advisers	A bevy of ladies, girls, swans
A host of angels	A code of laws
A nest of ants	A course of lectures
A quiver of arrows	A company of merchants, actors
A galaxy of beauties	A chain of mountains, events
A hive of bees	A gallery of pictures, paintings
A peal of bells	A rope of pearls
A flight of birds, bees, locusts	A crowd of people
A library of books	An album of photos, stamps
A pile of books	An anthology of poems
A pack of cards, asses, wolves	A class of pupils
A train of carriages, followers	A volley of questions
A herd of cattle, deer	A shower of rain, arrows, bullets
A row of chairs, trees	A beam of rays
A suit of clothes	A troop of scouts
A collection of coins, wheat	A fleet of ships, cars
A gang of convicts, prisoners, thieves	A choir of singers, angels
A bale of cotton, wool	A band of singers, musicians, robbers
A board of directors	A battalion of soldiers
A series of events	An army of soldiers
A block of flats	A heap of stones, ruins
A party of musicians, friends	A batch of students
A basket of fruits	A curriculum of course, students
A stock of goods	A set of tools
A shock of hair	A forest of trees
A team of players, horses	A grove of trees
A group of people, islands	A pack of wolves

### C. Appropriate Terms for Comparisons

- As **ambitious** as the *devil, Lady Macbeth*  
 As **beautiful** as a *rainbow, sunset, Nepal*  
 As **big** as an *elephant, whale*  
 As **black** as *coal, crow, midnight*  
 As **blue** as *indigo, sky*  
 As **boundless** as the *ocean*  
 As **brave** as a *lion*  
 As **brief** as a *dream, time*  
 As **bright** as *day, silver, star*  
 As **busy** as a *bee*  
 As **changeable** as the *moon, weather-cock*  
 As **cool** as a *cucumber*  
 As **cruel** as *death*  
 As **dark** as a *dungeon, midnight, ditch*  
 As **deaf** as a *beetle, post*  
 As **deep** as a *well, ocean*  
 As **dry** as a *stick, dust*  
 As **dumb** as a *statue*  
 As **easy** as *A,B,C, lying*  
 As **empty** as *space*  
 As **fast** as a *hare, light*  
 As **fat** as a *pig*  
 As **foolish** as a *calf*  
 As **free** as *air*  
 As **fresh** as *dew, rose*  
 As **gentle** as a *lamb, dove*  
 As **gloomy** as *night*  
 As **glorious** as the *sun*  
 As **greedy** as *wolf, dog*  
 As **happy** as a *child, lark*  
 As **hard** as a *stone, marble*  
 As **heavy** as *lead*  
 As **high** as *heaven, star*  
 As **hot** as *fire, pepper*  
 As **hungry** as a *wolf*  
 As **industrious** as an *ant*  
 As **invisible** as *air*  
 As **kind** as *Mother Teresa*  
 As **large** as the *universe*  
 As **lasting** as the *pyramids*  
 As **lazy** as *toad*  
 As **light** as a *feather, air*  
 As **loud** as *thunder*  
 As **new** as *day*  
 As **nimble** as a *squirrel*  
 As **noiseless** as a *shadow*  
 As **numerous** as the *sands*  
 As **opposites** as the *poles*  
 As **peaceful** as *sleep*  
 As **pointed** as a *needle*  
 As **pretty** as a *picture*  
 As **proud** as a *peacock*  
 As **pure** as *lily*  
 As **red** as *blood, cherry, rose, fire*  
 As **regular** as a *clock, sunrise*  
 As **rich** as a *Jew*  
 As **secret** as *thought*  
 As **selfish, sly** as a *fox*  
 As **sharp** as a *knife, razor*  
 As **silent** as *death*  
 As **simple** as *ABC*  
 As **slow** as a *snail*  
 As **smooth** as *glass, velvet*  
 As **soft** as *silk*  
 As **sour** as *vinegar*  
 As **steady** as a *rock*  
 As **strong** as a *horse*  
 As **stupid** as an *ass, donkey*  
 As **sudden** as *lightning*  
 As **sure** as *death, fate, sunrise*  
 As **sweet** as *honey, rose, sugar*  
 As **tall** as *Everest*  
 As **ugly** as a *scarecrow*  
 As **uncertain** as the *weather, wind*  
 As **unchangeable** as the *past*  
 As **warm** as *sunbeams, wool*  
 As **weak** as a *baby, rat*  
 As **white** as *snow*

**D. Appropriate Terms for Sounds Made by Animals**

<b>Animal</b>	<b>Sounds</b>	<b>Animal</b>	<b>Sounds</b>
Apes	gibber	Horses	neigh
Asses	bray	Hyenas	laugh
Babies'	lisper	Jackals	howl
Bears	growl	Kites	scream
Bees	hum/buzz	Kittens	mew
Beetles	drone	Lions	roar
Birds	chirp/twitter	Monkeys	chatter/gibber
Bulls	bellow	Owls	hoot/scream
Camel	grunt	Oxen	low
Cattle	low	Parrots	chatter/talk
Cocks	crow	Peacocks	strut
Crows	caw	Pigeons	coo
Cuckoos	coo	Pigs	grunt/squeak
Dog	bark/growl/howl	Puppies	yelp
Donkeys	bray	Rabbits	squeal
Doves	coo	Sheep	bleat
Ducks	quack	Snakes	hiss
Elephants	trumpet	Sparrows	chirp/twitter
Flies	buzz	Squirrels	squeak
Foxes	bark	Tiger	growl
Frogs	croak	Vultures	scream
Goats	bleat	Wolves	howl/growl

**E. Appropriate Terms for Sounds Made by Objects**

<b>Objects</b>	<b>Sounds</b>
Airplanes	zoom
Bells	ring
Bullets	whiz
Chains	clank
Clocks	tick
Clouds	thunder
Coins	jingle
Doors	creak
Drum	beat
Engines, Wind	whistle
Footsteps	sound
Guns	boom
Hands	clap
Hoofs	clatter
Keys	jingle
Leaves	rustle
Metals	ring
Rain	patters
Water	ripple

## F. Commonly Used Abbreviations

This is the list of some abbreviations that are common in English but some are origin from Latin and French.

<b>Short Form</b>	<b>Full Form</b>	<b>Meaning (Related To)</b>
<b>A.D.</b>	Anno Domini	<i>in the year of our lord</i>
<b>a.m.</b>	ante meridian	<i>before noon</i>
<b>ab in</b>	ab initio	<i>from the beginning</i>
<b>B.C.</b>	Before Christ	<i>before the birth of the christ</i>
<b>cf.</b>	confer	<i>compare</i>
<b>e.g.</b>	exempli gratia	<i>for example</i>
<b>et al</b>	et alia	<i>and other people or thing</i>
<b>et seq.</b>	et sequential	<i>and what follows</i>
<b>etc</b>	et cetera	<i>and the rest; and so on</i>
<b>i.e.</b>	id est	<i>that is</i>
<b>lb</b>	libra	<i>pounds in weight</i>
<b>Litt. D.</b>	Liter arum doctor	<i>doctor of letters</i>
<b>LL. B</b>	Legume baccalaurus	<i>Bachelor of Laws</i>
<b>Loc. Cit.</b>	Loco citato	<i>in the passage cited</i>
<b>MD/DM</b>	Medical Doctor	<i>Doctor of Medicine</i>
<b>N.B.</b>	Nota Bene	<i>note carefully</i>
<b>p.a</b>	per annum	<i>per year</i>
<b>p.m.</b>	post meridian	<i>after noon</i>
<b>pro tem.</b>	Pro tempore	<i>for the time</i>
<b>q.v</b>	quod vide	<i>which see</i>
<b>R.I.P</b>	requiescat in pace	<i>May he/she rest in peace</i>
<b>RSVP</b>	repondez sil vous plait	<i>please reply</i>
<b>Viz.</b>	videlicet	<i>namely</i>

## G. Habits of People

### 1. People Hater of:

Alcoholic drinks	:	<i>Teetotaler</i>
Idol worship (Popular beliefs)	:	<i>Iconoclast</i>
Knowledge	:	<i>Misologist</i>
Mankind	:	<i>Misanthrope</i>
Marriage	:	<i>Misogamist</i>
War	:	<i>Pacifist</i>
Women	:	<i>Misogynist</i>
Worldly Life	:	<i>Recluse</i>

### 2. People Lover of:

Alcoholic drinks	:	Dipsomaniac
Book	:	Bibliophile
God	:	Theist
Good food	:	Gourmet
Human flesh	:	Cannibal
Mankind	:	Philanthropist
Money	:	Mercenary
One's Country	:	Patriot
Peace	:	Pacifist
Self	:	Narcissist
War	:	Warmonger
Words	:	Philologist

### 3. People of Collection:

at a Concert/Lecture	:	Audience
at a Funeral	:	Mourners
at a Match	:	Spectators
in a Church/Temple	:	Congregation
in a Riot	:	Mob
in a Road Scene	:	Rabble
in a Street	:	Crowd
listening a Broadcasting Program	:	Listeners
watching a TV Program	:	Viewers



## H. Saying and Proverbs

Proverbs are the well known phrases or sentences that give advice or say something that is generally true.

1. **A bad man blames his tools:** An uninterested workman puts the blame for the poor performance on the environment or on the machines.
2. **A burnt child dreads fire:** Experience is the best teacher.
3. **A drop in the ocean:** A little thing is lost in large.
4. **A friend in need is a friend in deed:** A friend who remains along with you during difficulty is a true friend.
5. **A hamlet without Prince of Denmark:** Doing something without essential part.
6. **A rolling stone gathers no moss:** Continuous activity may not bring good results.
7. **Absence makes the heart grow fonder:** One loves even more when he is away from somebody that he loves.
8. **Absent or dead still let a friend dear:** Whether he is near or far, a real friend is always dear.
9. **Actions speak louder than words:** What a person actually does, mean more than what they say they will do.
10. **After clouds, a clear sun:** Happiness comes after sorrow or a day comes after night.
11. **All road leads to Rome:** The goal of most human activities and services is same – the up liftment of human beings.
12. **All that glitters is not gold:** The things that have a nice look and shining may not be good or the best.
13. **An apple a day keeps a doctor away:** Fresh fruits can help one to avoid many sicknesses.
14. **An eye for an eye:** You should punish somebody by doing to them what they have done to you.
15. **Ask much to have little:** We need to do a lot to get a little.
16. **Be good rather than rich:** It is better to be an honest than to be a rich.
17. **Birds of the same feather flock together:** Persons of the same nature tend to come together.
18. **Blood is thicker than water:** Family relationship lasts more than any other.
19. **Books can never teach the use of books:** We can't recognize ourselves.
20. **Charity begins at home:** We should help and care for our own family, before we start helping other people.
21. **Cheerful yesterdays and confident tomorrows:** Good past, best future.

22. **Count your gains than your losses:** Most of the people look only on their losses and forget about their gains they have made.
23. **Don't count your chickens before they are hatched:** Do your work, don't see the dream of the result.
24. **Don't judge a book by its cover:** You shouldn't form an opinion about sb/sth from their appearance only.
25. **Early to bed and early to rise makes a man healthy, wealthy and wise:** Good habits bring the good health and mental peace to one's daily life.
26. **East or west, home is the best:** Where ever we are, still our home comes in remembrance.
27. **Every cloud has a silver lining:** Every sad or difficult situation has a positive side.
28. **Every dog has its day:** Everyone has good luck or success at some point in their life.
29. **Every up has a down:** Bad time is not permanent it will be followed by good times.
30. **God help those who help themselves:** Self help is the first step to success.
31. **Home is where the heart is:** A home is where the people you love are.
32. **Honesty is the best policy:** People always appreciate & reward those who are honest.
33. **It never rains but pours:** Sometimes difficulties often come together.
34. **It'll be all right, on the night:** A performance or an event will be successful even if the preparations have not gone well.
35. **Like Father, like son:** A son's character or behavior is similar to that of his father.
36. **Love is blind:** When you love somebody, you can't see their faults.
37. **Many a little makes a pickle:** Drops and drops form an ocean.
38. **Nature is the best physician:** Most of the ailments can be cured naturally and with the help of the things of nature.
39. **Never say die:** Do not stop hoping.
40. **New broom sweeps well:** Young people sometimes do better than the old occupants.
41. **No news is good news:** When we hear nothing, it is likely that sth bad has happened.
42. **No pain, no gain:** We need to suffer, if we want to achieve sth.
43. **Nothing succeeds like success:** When we are successful in one area of our life, it often leads to success in other areas.
44. **Nothing succeeds like success:** little success encourage one to go for the greater success.
45. **Old is gold:** Things and events of the past are indeed valuable and precious.
46. **One cannot pump ocean out:** Certain things are beyond our reach, capacity and understanding.

## 14 | English

47. **One man's meat is another man's poison:** Different people like different things; what one likes very much, another does not like at all.
48. **Out of sight, out of mind:** Persons or the thing not seen for long are soon forgotten.
49. **Prevention is better than cure:** If we be careful in the initial stages, we will be free from unexpected situations.
50. **Putting the cart before the horse:** Giving importance to the wrong item or keeping things in wrong order.
51. **Rome was not built in a day:** Great achievements and complicated task require a great deal.
52. **Silence is golden:** Silence can settle many mental aches and disputes.
53. **Slow and steady wins the race:** Constancy and regularity are bound to bring good results.
54. **Spare the rod and spoil the child:** Certain amount of punishment is good for the proper growth of children.
55. **Stone walls do not make a prison:** A free mind can never be chained.
56. **Strike while the iron is hot:** Grab the opportunity at the most favorable time.
57. **The worm will turn:** One who is normally quiet and doesn't complain will protest when the situation becomes too hard to bear.
58. **Time and tide waits for no man:** Time lost in doing nothing or a useless thing is lost forever.
59. **To err is human:** All human beings however big or important make a mistake.
60. **Truth is stranger than fiction:** The things that actually happen are often more surprising than the stories that are invented.
61. **Two wrongs don't make a right:** The situation will not be improved by doing sth bad.
62. **Variety is the spice of life:** New and exciting experiences make life more interesting.
63. **Waste not, want not:** If you never waste anything, especially food or money, you will always have it when you need.
64. **Where there is a will, there is a way:** No amount of difficulties can prevent a determined mind from going ahead.
65. **You've made your bed & you must lie on it:** We must accept the results of our actions.

## I. Antonyms (Opposites)

Antonym is a word that means the opposite of another word. Below is a list of some antonyms.

<b>Word</b>	<b>Antonyms</b>		
Able	unable	Attract	repel
Above	below	Avoid	meet, face
Absent	present	Aware	ignorant
Absolute	limited	Backward	forward
Absorb	emit, eject	Barren	fertile
Accept	reject	Beautiful	ugly
Accidental	intentional	Beauty	ugliness
Accuse	defend	Begin	end
Acknowledge	deny, disown	Bind	loosen
Active	passive	Bitter	sweet
Admit	deny	Black	white
Admire	despise	Blame	praise
Advance	retreat	Blunt	sharp
Agree	differ	Bold	timid
Always	never	Borrow	lend
Ambiguous	clear	Bottom	top
Analysis	synthesis	Bright	dark
Ancient	modern	Bye	welcome, cheer
Appoint	dismiss	Care	neglect
Appear	disappear	Careful	careless
Approach	retire	Cautious	reckless
Argue	consent	Certain	uncertain
Arrogant	humble	Civilization	barbarism
Arrive	depart	Civil	rude
Ascend	descend	Clever	stupid
Assemble	disperse	Collect	scatter
Associate	dissociate	Comedy	tragedy
Attack	defend	Common	rare

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Compare	contrast	Enthusiasm	apathy
Complete	incomplete	Enemy	friend
Compulsory	optional	Enter	exit
Confess	deny	Ever	never
Confident	diffident	Evil	good
Conquer	lose	Exclude	include
Construct	expand	Export	import
Convex	concave	Extraordinary	ordinary
Correct	incorrect	Fade	bloom
Credit	debit	Failure	success
Crude	refined	Famous	notorious
Danger	safety	Fertile	barren
Dawn	dusk	Find	lose
Dead	alive	First	last
Decrease	Increase	Flexible	rigid
Deep	shallow	Freedom	bondage
Defensive	offensive	Fresh	stale
Dense	thin	Front	back
Diminish	increase	Full	empty
Distress	comfort	Gather	scatter
Different	same	General	particular
Difficult	easy	Gentle	rude
Diligent	lazy	Genuine	counterfeit
Do	undo	Giant	dwarf
Drizzle	downpour	Give	take
Dynamic	static	Glory	disgrace
Eager	indifferent	Grand	mean
Early	late	Great	small
Earn	spend	Guest	host
Ebb	flow	Handsome	ugly
Empty	full	Happiness	misery
Enjoy	suffer	Happy	sad
Enrich	impoverish	Harmony	discord

Haste	delay	Living	dead
Help	hinder	Lock	unlock
Height	depth	Loose	tight
Hit	miss	Love	hatred
Honor	shame	Major	minor
Hope	despair	Majority	minority
Humble	proud	Mild	harsh
Idle	busy, diligent	Moderation	excess
Ignorance	knowledge	Modern	ancient, old
Illuminate	darken	Monotony	variety
Ill	well	Mortal	immortal
Imaginary	real	Mountain	plain
Important	trivial,	Native	foreign
unimportant		Natural	artificial
Inhale	exhale	Negative	positive
Initial	final	Negligent	diligent
Innocent	guilty	Noise	silence
Intelligible	unintelligible	Normal	abnormal
Join	separate	Numerous	few
Joy	sorrow	Occasional	frequent
Junior	senior	Odd	even
Justice	injustice	Old	young, new
Kind	unkind	Oppose	support
Kindness	cruelty	Optimist	pessimist
Labour	rest	Oral	written
Lazy	industrious	Order	confusion, chaos
Laugh	weep	Particular	general
Legal	illegal	Peace	war
Liberty	bondage	Permit	prohibit
Lie	truth	Please	displease
Life	death	Pleasure	pain
Light	darkness, heavy	Plenty	scarcity
Liquid	solid	Polite	impolite

**18 | English**

Pride	humility	Spiritual	material
Progressive	regressive	Success	failure
Prompt	slow	Summit	base
Proper	improper	Sweet	bitter
Public	private	Sympathy	antipathy
Punish	reward	Synonym	antonym
Question	answer	Theory	practice
Raise	lower	Tight	loose
Rare	common	Total	partial
Rational	irrational	Transparent	opaque
Raw	cooked	Truth	falsehood
Rejoice	grieve	Uniform	varied
Relieve	aggravate	Unity	diversity
Religious	irreligious	Use	abuse
Renowned	infamy	Vacant	occupied
Reveal	hide	Vertical	horizontal
Right	wrong	Violent	gentle
Ripe	raw	Virtue	vice
Rough	smooth	Visible	invisible
Rural	urban	Voluntary	compulsory
Sacred	profane	Vulgar	refined
Safe	unsafe	War	peace
Same	different	Weep	laugh
Secure	insecure	Whole	part
Sense	nonsense	Win	lose
Servant	master	Wisdom	folly
Sleep	wake	Wise	unwise, foolish
Smile	frown	Worst	best
Speech	silence		

## J. Similar Words (Confusing Words)

The below is a list of words that may be pronounced similar but are different when spelled and also carry different meaning.

1. **Abject:** utterly hopeless or humiliating.  
**Object:** purpose
2. **Accede:** to agree. **Exceed:** to be greater than.  
**Access:** approach.
3. **Accept:** to take willingly something that is offered or to receive; to agree to sth  
**Except:** apart from
4. **Accident:** an unforeseen event (it need not result in an injury).  
**Injury:** to get hurt physically.
5. **Admit:** to allow to enter or to confess.  
**Confess:** to own or admit as true.
6. **Adopt:** take up, to take as one's own  
**Adept:** expert  
**Adapt:** change according to the situation.
7. **Advise (verb):** to give suggestion for improvement  
**Advice (noun):** points for improvement
8. **Affect (verb):** to produce a change in someone or something  
**Effect (noun):** a result
9. **Allusion:** an indirect reference.  
**Illusion:** a deception
10. **Amend:** to change something for better; (note: it is applied mainly to personal behavior and to the process of revising a formal document).  
**Emend:** to remove errors from (something written) (Note: it is applied mainly to the activity of textual scholars).
11. **Amoral:** ignorant or morality.  
**Immoral:** not conforming to accepted standards of morality.
12. **Analysis:** taking apart.  
**Synthesis:** putting together.
13. **Artiste:** professional singer or actor or dancer  
**Artist:** a person who practices one of the fine arts especially painting.
14. **Ascent:** an upward journey



## 20 | English

- Assent:** agreement to something  
**Accent:** a way of pronouncing the words of a language that shows which country, area or social class a person comes from.
15. **Believe:** have faith in  
**Feel:** you feel with your senses  
**Think:** you think with your mind
16. **Berth:** a sleeping place in the train  
**Birth:** to be born
17. **Beside:** at the side of  
**Besides:** in addition to
18. **Born:** take birth  
**Borne:** bear, carry
19. **Can:** is able to  
**May:** is permitted to
20. **Canvas:** a strong heavy material used for making tents, etc. and by artists for painting on  
**Canvass:** to seek vote during election
21. **Carton:** A light cardboard container  
**Cartoon:** a drawing made in an exaggerated style for humorous or satirical effect.
22. **Cast:** throw, allow to fall or drop  
**Caste:** a hereditary social class
23. **Cemetery:** a place where the dead are buried  
**Symmetry:** exact correspondence
24. **Cite:** quote  
**Site:** the place
25. **College:** an educational institution (high school, university)  
**Collage:** a picture made by sticking small pieces of cloth, etc. onto sth.
26. **Collision:** crashing of two things into each other  
**Collusion:** secret agreement in order to do something dishonest.
27. **Complement:** to add to something in a way that improves it  
**Compliment:** praise, wishes
28. **Condole:** to express sympathy with  
**Console:** to comfort in grief
29. **Confidant:** a friend who is very close

- Confident:** having faith in oneself or in others
30. **Confirm:** endorse  
**Conform:** adapt to rule  
**Concede:** admit as true
31. **Dairy:** milk farm  
**Diary:** book which keeps a record
32. **Decease:** the death of a person  
**Disease:** an illness
33. **Decent:** respectful  
**Descent:** come down  
**Dissent:** disagreement
34. **Defer:** postpone  
**Differ:** not same
35. **Defuse:** to remove potential danger from a crisis  
**Diffuse:** to disperse
36. **Depend:** to rely  
**Defend:** to protect, save
37. **Dependent (adjective):** needing someone or something in order to survive or be successful  
**Dependant (noun):** one who depends on another
38. **Device (noun):** tool  
**Devise (verb):** invent
39. **Die:** to face death  
**Dye:** to give color
40. **Discover:** to find sth that was not known  
**Invent:** to devise sth by human effort
41. **Dose:** certain quantity  
**Doze:** a short sleep
42. **Emigrant:** someone who leaves his or her home country  
**Immigrant:** one who comes to live in a country from abroad
43. **Empathy:** showing closeness to the feelings of someone  
**Sympathy:** sharing of emotions or sharing or consoling someone in times of trouble or sorrow
44. **Empty:** an empty bottle

## 22 | English

- Vacant:** a vacant house
45. **Erupt:** eject forcibly or suddenly  
**Irrupt:** break into forcibly or suddenly
46. **Evoke:** to call up (a response, a feeling, etc)  
**Invoke:** to appeal to (an authority) for help, etc
47. **Exalt:** to praise highly  
**Exult:** to feel great joy
48. **Expert:** skilful  
**Excerpt:** an extract
49. **Fair:** beautiful; small market  
**Fare:** cost of a ticket
50. **Foreword:** an introductory statement in a book  
**Forward:** relates to frontward movement or position.
51. **Forth:** forward  
**Fourth:** 4<sup>th</sup>
52. **Fowl:** bird  
**Foul:** very unpleasant; very bad
53. **Goal:** aim  
**Gaol:** jail
54. **Hail:** small balls of ice that fall like rain  
**Hale:** strong and healthy
55. **Heal:** to get cured  
**Heel:** back part of the foot
56. **Human:** person  
**Humane:** kind and generous
57. **Illegible:** handwriting which cannot be read  
**Eligible:** qualified
58. **Imaginary:** unreal  
**Imaginative:** inventive
59. **Jealous:** not feeling happy with other's success, etc; envious  
**Zealous:** full of enthusiasm
60. **Junction:** a point at which roads or railway lines meet or cross  
**Juncture:** point of time
61. **Latter:** the second part

- Later:** after some time
62. **Lay:** put sth down (lay, laid, laid)  
**Lie:** be in a horizontal position or to be placed (lie, lay, lain)
63. **Licence (noun):** permission  
**License (verb):** allowed
64. **Omit:** to omit sth is to leave it out  
**Emit:** to emit sth is to send it out
65. **Pail:** bucket  
**Pale:** having skin that is whiter than usual because of illness, a strong emotion, etc
66. **Personnel:** staff of a company, etc  
**Personal:** concerning to an individual person
67. **Plain:** flat land  
**Plane:** a level surface, an aircraft, or a tool used in carpentry
68. **Pray:** implore to god  
**Prey:** an animal hunted by another for food
69. **Pride:** a quality of being boastful about talents or success  
**Proud:** boastful
70. **Principle:** rule, law  
**Principal:** head of an institution
71. **Pull:** draw  
**Pool:** pond
72. **Quite:** fairly, absolutely  
**Quiet:** silent
73. **Rays:** streams of light  
**Raze:** destroy
74. **Sore:** tender and painful  
**Soar:** fly high
75. **Soul:** the spiritual part of a person  
**Sole:** one and only; the bottom surface of the foot
76. **Stationery:** paper and other things needed for writing  
**Stationary:** not moving, fixed
77. **Theft:** taking illegally or without permission of the owner  
**Burglary:** entering premises of another person to commit a crime  
**Robbery:** stealing with violence

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78. **Umpire:** referee  
**Empire:** dominion
79. **Vain:** pride  
**Wane:** become less
80. **Vine:** a climbing plant which produces grapes  
**Wine:** the alcoholic drink obtained from fruits
81. **Vocation:** profession  
**Vacation:** holidays  
**Leave:** permission to be absent from duty
82. **Weather:** the condition of the atmosphere at a particular place and time  
**Whether:** used to express a doubt or choice between two possibilities
83. **A lot:** many  
**Allot:** to give time, money, tasks, etc
84. **Loath (adjective):** unwilling  
**Loathe (verb):** to hate intensely
85. **Raise:** to make higher or build  
**Rise:** to get up or become elevated

## K. Idioms and Phrases

An idiom is a phrase whose meaning is difficult or sometimes impossible to guess by looking at the meaning of the individual words it contains. Below is a list of some idioms and phrases.

1. **A bird's eye-view:** cursory glance
2. **A burning question:** an important problem
3. **A child's play:** an easy job
4. **A past master:** an expert
5. **A red letter day:** a highly memorable day
6. **A short cut:** a quick way
7. **A stone's throw:** very close by
8. **A1:** Excellent
9. **Absent minded:** inattentive, forgetful
10. **According to:** in the view of
11. **All in all:** having all powers and authority
12. **All the same:** nevertheless
13. **Alpha to omega:** A to Z, from beginning to end
14. **At the outset:** at the very beginning
15. **At the zenith:** at the highest level
16. **Beat about the bush:** to talk about irrelative matters
17. **Black and blue:** severely
18. **Bring to light:** to expose
19. **Burn one's finger:** get into trouble
20. **Burning question:** a very important question for issue
21. **Call in question:** in doubt
22. **Carry out:** to do
23. **Come into force:** to be in operation
24. **Give a piece of one's mind:** scold
25. **In need of:** in want of
26. **In spite of:** even though
27. **Neither head nor tail:** cannot understand anything
28. **On and on:** continuously
29. **Out of the blue:** suddenly and unexpectedly
30. **Pop the question:** to ask somebody to marry you
31. **Right and left:** in all directions

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32. **Safe and sound:** quite safely
33. **Sitting on the fence:** not decided
34. **To be born with a silver spoon in one's mouth:** to be born rich
35. **To be hand and love with:** to be good friends
36. **To break the news:** to give bad news
37. **To bring home:** make one realize
38. **To call to account:** scold
39. **To carry the day:** to win, victory
40. **To catch the eye:** to attract attention
41. **To come of age:** to become a young person
42. **To come off with flying colors:** to succeed well
43. **To fall to the ground:** to come to nothing
44. **To fish in troubled waters:** to take advantage of other's difficulties.
45. **To get into hot water:** to get into trouble
46. **To get rid of:** to remove
47. **To go a long way:** to have much to do
48. **To hang in the balance:** to be uncertain
49. **To hold one's tongue:** not to talk about
50. **To keep one in the dark:** to keep uninformed
51. **To lend a hand:** to help
52. **To make up one's mind:** to decide
53. **To play with fire:** to play with danger
54. **To rain cats and dogs:** to rain heavily
55. **To take off:** to start
56. **To take to heels:** to run away
57. **Twenty-four seven (24/7):** twenty four hours a day, seven days a week
58. **Ups and downs:** hard and fast: very strict
59. **Up-to-date:** to be modern
60. **When pigs fly:** something that will never happen

## L. Prefix & Suffix

Prefix is a word which is placed before a word to add or to change its meaning and Suffix is a word which is placed at the end of a word to add or to change its meaning. Prefix generally alters the meaning of a word and suffix change its part of speech.

### Prefix

1. **Ambi, amb** (on both sides, around): Ambiguous, ambition, amputate, etc
2. **Ante** (before): Antedate, anticipate, ancestor, antechamber, etc
3. **Anti, ant** (against): Antidote, antagonist, antichrist, antipathy, etc
4. **Arch** (chief, main): Archbishop, archangel, architect, etc
5. **Auto** (self): Autocrat, autobiography, autograph, etc
6. **Bis** (twice, two): Biscuit, bisect, binocular, etc
7. **Circum, circu** (around): Circumnavigate, circumference, circuit, etc
8. **Con** (with, together): Contend, collect, combine, etc
9. **Contra** (against): Contradict, counteract, counterfeit, etc
10. **De** (in opposite of): Descend, dethrone, detach, etc
11. **Dia** (through): Diameter, diagonal, etc
12. **Dis, dif, di** (apart, asunder): Dishonor, disjoin, displease, differ, etc
13. **En, em** (in): Encyclopedia, emblem, etc
14. **Epi** (upon): Epilogue, epitaph, etc
15. **Eu** (well): Eulogy, euphony, eugenics, etc
16. **Ex, ef** (out of): Expel, extract, effect, ex-president, exodus
17. **Extra** (beyond, outside of): Extraordinary, extravagant, etc
18. **Hemi** (half): Hemisphere
19. **Homo, hom** (like): Homogeneous, homonym, etc
20. **In, il, im, ir** (not): Insure, illegal, imprudent, irregular, etc
21. **In, il, im, ir, en, em** (in, into): Invade, illustrate, immerse, irritate, enact, embrace
22. **Inter, intro, enter** (among, within): Intervene, introduce, entertain, etc
23. **Male, mal** (ill, badly): Malevolent, malcontent, malefactor, malignant, etc
24. **Meta, met** (implying, change): Metaphor, metonymy, etc
25. **Mono** (alone, single): Monoplane, monopoly, monarch, etc
26. **Non** (not): Nonsense, none, etc
27. **Ob, oc, of** (in the way of, way of, against): Object, occupy, offend, etc
28. **Omni** (all): Omnipotent, omniscient, etc
29. **Pan** (all): Panacea, panorama, pantheism, etc



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30. **Para** (beside, by the side of): Parallel, paradox, parasite, etc
31. **Pen** (almost): Penultimate, peninsula, etc
32. **Pente** (five): Pentagon, pentameter, etc
33. **Per, pel** (through): Pervade, pellucid, etc
34. **Peri** (round): Perimeter, period, periscope, etc
35. **Philo, phil** (love): Philosophy, philanthropy, etc
36. **Poly** (many): Polytheist, polygon, polygamy, etc
37. **Post** (after): Postscript, postdate, postpone, etc
38. **Pre** (before): Prefix, prevent, etc
39. **Pro** (before): Proceed, prophecy, program, etc
40. **Pseudo** (false): Pseudonym, pseudo-philanthropist, etc
41. **Re** (again): Regain, repeat, return, renew, etc
42. **Retro** (backwards): Retrospect, retrograde, etc
43. **Semi** (half): Semicircle, semicolon, etc
44. **Sub** (under): Subject, suffer, subconscious, etc
45. **Super, sur** (over, above): Supernatural, superman, surpass, etc
46. **Syn, sym, syl** (with, together): Synonym, syntax, sympathy, syllable, etc
47. **Trans, tra, tres** (across): Transfer, traverse, trespass, transmit, etc
48. **Tre, tri** (three): Triangle, tripod, treble, etc
49. **Uni** (one): Universal, uniform, unanimous, etc
50. **Vice** (in the place of): Viceroy, vice-president, etc

## Suffix

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### **Archy** (rule or government)

Anarchy: a state of disorder due to lack of control

Hierarchy: a system of ranking based on status or rank

Matriarchy: a system of society headed by women

Patriarchy: a system of society headed by men

### **Arium** (a place)

Aquarium: a tank for water plants and fishes

Columbarium: a place where funeral urns are kept

Rosarium: a rose garden

### **Cide** (kill, killer)

#### Killing of another

Genocide: killing of a large number of people

Infanticide: killing a baby or an infant

Matricide: killing of a mother

Patricide: killing of a father

Suicide: killing of oneself

A substance used to destroy plants or animal life

Fungicide: a substance used to destroy fungi

Germicide: a substance used to kill germs

Insecticides: a substance used to kill insects

Pesticide: a substance used to kill pests

**Graphy** (writing)

Calligraphy: decorative handwriting

Ethnography: the study of different peoples

Geography: the study of physical features of the earth

Petrography: the study of rocks

Radiography: the production of images by X-rays

Topography: the arrangement of the physical features of an area

**Gregis** (herd)

Aggregate: combination of several elements

Congregate: gather into a crowd

Segregate: separate from the main group

**Mania** (a type of madness or extreme likeness)

Anthomania: a passion for flowers

Erotomania: obsessive sexual desire

Graphomania: a morbid compulsion for writing

Mythomania: an abnormal tendency to tell lies

**Onym** (name)

Anonym: an anonymous person or thing

Antonym: words having opposite meaning

Cryptonym: a code name

Synonym: a word having same or similar meaning

**Phile** (Loving, lover of)

Bibilophile: a person who loves book

Oenophile: a wine connoisseur

Technophile: a person who loves new technology

Termophile: an organism that lives in hot temperature

**Phobia** (extreme or irrational fear or dislike)

Alogophobia: fear of pain

Androphobia: fear of males and Gynophobia: fear of women

Nyctophobia: fear of night or darkness

Ophidiophobia: fear of snakes

Xenophobia: fear or dislike of strangers, foreigners or aliens

**M. Some Polite Words and Sentences**

1. Thank you
2. Thanks
3. Thanks a lot
4. No, thank you
5. Please
6. Excuse me
7. Sorry
8. I am extremely sorry
9. I am very much sorry
10. I am sorry to hear it
11. Sorry wrong number
12. Sorry you are disqualified
13. Welcome
14. You are most welcome
15. You are heartily welcome
16. It's my pleasure
17. Nice to meet you
18. See you again
19. Same to you
20. It's okay
21. Pardon
22. I beg your pardon
23. No matter
24. No mention
25. How do you do?
26. That sounds good
27. Keep in touch
28. Can you.....?
29. May I.....?
30. Shall I.....?
31. Have a nice day
32. Have a safe journey
33. Have a sweet dream
34. Goodnight
35. Goodbye
36. Can you do me a favor?
37. I am afraid....

## Chapter 2

# Physics



Physics is the branch of science, which deals with the systematic study of matter and energy and their action upon each other. It is applied in the fields of aeronautics, electricity, heat, light, mechanics and sound. The science of physics includes many sub-branches like atomic physics, quantum physics and atmospheric physics. Atomic physics deals with atom as a whole while nuclear physics deals specifically with the study of sub-atomic particles. Quantum physics deals with discrete indivisible units of energy called quanta as described by the quantum theory. Atmospheric physics is the application of physics to the study of the atmosphere.

Physics is one of the oldest academic disciplines, perhaps the oldest through its inclusion of astronomy. Over the last two millennia, physics was a part of natural philosophy along with chemistry, biology, and certain branches of mathematics. Physics also makes significant contributions through advances in new technologies that arise from theoretical breakthroughs. For example, advances in the understanding of electromagnetism or nuclear physics led directly to the development of new products that have dramatically transformed modern-day society, such as television, computers, domestic appliances, and nuclear weapons; advances in thermodynamics led to the development of industrialization, and advances in mechanics inspired the development of calculus.

## A. Measurement

The process of comparison of unknown physical quantities with known standard quantity is known as measurement. We need the measurement in our daily life. We have to measure length, mass, time, volume and amount of various materials in our day-to-day life. The things that can be measured are physical quantities.



### Definitions of Some Physical Quantities

**Length:** The distance between any two points is known as length. Its unit is metre (m).

**One Standard Metre:** The distance between two scratches of golden lines in the platinum iridium scale which is kept at constant temperature of  $0^{\circ}\text{C}$  and normal atmospheric pressure at international bureau of weights and measurement (France) is known as one standard metre.

**Mass:** The quantity of matter contained in a body is called as mass. Its unit is kilogram (kg).

**One Standard Kilogram:** The mass of platinum iridium cylinder which is kept at international bureau of weights and measurements; France is known as one standard kilogram.

**Time:** The interval between any two events is known as time. Its unit is second (s).

**One Solar Day:** The time taken by the earth to complete one rotation in its own axis with respect to the sun is known as one solar day.

**One Second:** The 84600 parts of a solar day is known as one second.

**Zenith:** The particular point in the space above an observer standing on the earth is defined as zenith.

**Area:** The total surface covered by an object is known as area. Its unit is square metre ( $\text{m}^2$ ).

**Volume:** The total space occupied by an object is known as volume. Its unit is cubic metre ( $\text{m}^3$ ).

**Density:** The mass per unit volume of a substance is called its density. The ratio of density of a body to the density of water at  $4^{\circ}\text{C}$  is known as relative density. Its unit is kilogram per cubic metre ( $\text{Kg}/\text{m}^3$ ).

**Seven base units of S.I. units**

Quantity	Name	Symbol
Length	Metre	m
Mass	Kilogram	kg
Time	Second	s
Electric current	Ampere	A(c/s)
Thermodynamic temperature	Kelvin	K
Amount of substance	Mole	mol
Luminous intensity	Candela	cd
Quantity	Name	Symbol
Length	Metre	M
Mass	Kilogram	Kg
Time	Second	S
Electric current	Ampere	A(c/s)
Thermodynamic temperature	Kelvin	K
Amount of substance	Mole	Mol
Luminous intensity	Candela	Cd

**S.I Supplementary Units**

Quantity	Name	Symbol
Plane angle	Radian	Rad
Solid angle	Steradian	Sr

**S.I Units**

Quantity	Unit	Symbol
Area	square metre	m <sup>2</sup>
Volume	cubic metre	m <sup>3</sup>
Density		kg/ m <sup>3</sup>
Distance	Metre	M
Displacement	Metre	M
Speed		m/s

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<b>Velocity</b>		m/s
<b>Acceleration</b>		m/s <sup>2</sup>
<b>Momentum</b>		kgm/s
<b>Force</b>	Newton	N (kgm/s <sup>2</sup> )
<b>Weight</b>	Newton	N or kg-wt
<b>Weight density</b>		N /m <sup>3</sup>
<b>Torque</b>		Nm
<b>Acceleration due to gravity</b>		m/s <sup>2</sup>
<b>Universal gravitational constant</b>		Nm <sup>2</sup> /kg <sup>2</sup>
<b>Moment of force</b>		Nm
<b>Pressure</b>	Pascal	Pa (N/m <sup>2</sup> )
<b>Impulse</b>		Ns
<b>Angular displacement</b>	Radian	Rad
<b>Angular momentum</b>		kgm <sup>2</sup> /s
<b>Angular velocity</b>	radian per sec	rad/s
<b>Angular acceleration</b>	radian per sec square	rad/s <sup>2</sup>
<b>Moment of inertia</b>		kgm <sup>2</sup>
<b>Work</b>	Joule	J (Nm)
<b>Power</b>	Watt	W(j/s)
<b>Energy</b>	Joule	J (Nm)
<b>Electric charge</b>	Coulomb	C(As)
<b>Potential difference</b>	Volt	V(J/C)
<b>Capacitance</b>	Farad	F (C/V)
<b>Electric resistance</b>	Ohm	Ω(V/A)
<b>Electric conductance</b>	Seimens	S (A/V)
<b>Electric potential</b>	Volt	V(J/C)
<b>Electromotive force</b>	Volt	V(J/C)
<b>Resistivity</b>	ohm-metre	Ω m
<b>Conductivity</b>	siemens per metre	S/m
<b>Electric flux</b>	Coulomb	C
<b>Electric flux density</b>		C/m <sup>2</sup>
<b>Permittivity</b>	farad per metre	F/m

<b>Magnetic flux</b>	Weber	Wb (Vs)
<b>Magnetic flux density</b>	Tesla	T (Wb/m <sup>2</sup> )
<b>Magnetic induction</b>	Ampere/metre	A/M
<b>Inductance</b>	Henry	H
<b>Electric intensity</b>	Newton/Coulomb	N/C (V/m)
<b>Magnetic field strength</b>	Ampere/metre	A/m
<b>Quantity of heat</b>	Joule	J
<b>Absolute humidity</b>		kg/m <sup>3</sup>
<b>Luminous flux</b>	Lumen	Lm
<b>Illuminance</b>	Lux	lx
<b>Quantity of light</b>	lumen-second	Lm-s
<b>Focal length</b>	Metre	m
<b>Power of lens</b>	Diopetre	D
<b>Time period</b>	Second	s
<b>Frequency</b>	Hertz	Hz
<b>Angular frequency</b>	revolution per sec	r/s
<b>Wavelength</b>	Metre	m
<b>Wave velocity</b>		m/s
<b>Electric energy</b>	kilowatt hour	kWh
<b>Intensity of sound</b>	Decibel	Db
<b>Atomic mass</b>	atomic mass unit	u
<b>Ionization energy</b>		KJ/mol

## Metric System of Measurement

### LENGTH

10 millimetres (mm)	= 1 centimetre (cm)
10 centimetres	= 1 decimetre (dm)
10 decimetres	= 1 metre (m)
10 metres	= 1 decametre (Dm)
10 decametres	= 1 hectometre (Hm)
10 hectometres	= 1 kilometre (km)



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### MASS

10 milligrams (mg)	= 1 centigram (cg)
10 centigrams	= 1 decigram (dg)
10 decigrams	= 1 gram (gm)
10 grams	= 1 decagram (Dg)
10 decagrams	= 1 hectogram (Hg)
10 hectograms	= 1 kilogram (kg)

### CAPACITY

10 millilitres (ml)	= 1 centilitre (cl)
10 centilitres	= 1 decilitre (dl)
10 decilitres	= 1 litre (l)
10 litres	= 1 decalitre (Dl)
10 decalitre	= 1 hectolitre (Hl)
10 hectolitres	= 1 kilolitre (kl)

### Some of the basic Conversion Factors

#### NUMERICAL

$\sqrt{2}$	= 1.414
$\sqrt{3}$	= 1.732
$\sqrt{5}$	= 2.237
$\pi$	= 3.142
$\pi^2$	= 9.87

#### LENGTH

1 m	= 100 cm	
1 km	= 1000 m	
1 inch	= 2.54 cm	
1 yard	= 0.9144 m	
1 foot	= 0.3048 m	
1 mile	= 1609.344 m	
1 nautical mile	= 1852 m	
1 light year (ly)	= $9.46 \times 10^{15}$ m	
1 parsec	= $3.084 \times 10^{16}$ m	= 3.26 ly
1 Astronomical Unit (AU)	= $1.5 \times 10^{11}$ m	
1 $\mu$ (micron)	= $10^{-4}$ cm	= $10^{-6}$ m
1 nm	= $10^{-9}$ m	
1 Å (angstrom)	= $10^{-8}$ cm	= $10^{-10}$ m

**MASS**

1 kg	= 1000 g	= $6.022 \times 10^{26}$ u
1 amu	= $1.6606 \times 10^{-27}$ kg	
1 metric ton	= 1000 kg	= $10^6$ g
1 pound	= 0.4536 kg	
1 slug	= 14.59 kg	
1 quintal	= 100 kg	

**TIME**

1 hr	= 60 min	= 3600 s
1 day	= 24 hr	= 1440 min = 86400 s
1 year	= 365.24 days	= $3.156 \times 10^7$ s
1 Astronomical Year	= $225 \times 10^6$ year	
1 Shake	= $10^{-8}$ s	

**AREA**

1 m <sup>2</sup>	= $10^4$ cm <sup>2</sup>
1 cm <sup>2</sup>	= $10^{-4}$ m <sup>2</sup>
1 barn	= $10^{-28}$ m <sup>2</sup>

**VOLUME**

1 m <sup>3</sup>	= $10^6$ cm <sup>3</sup>
1 cm <sup>3</sup>	= $10^{-6}$ m <sup>3</sup>
1 ml	= 1 cm <sup>3</sup>
1 litre	= 1000 cm <sup>3</sup> = $10^{-3}$ m <sup>3</sup> = 10 <sup>3</sup> cc
1000 litre	= 1 m <sup>3</sup>

**SPEED**

1 km/hr	= $\frac{5}{18}$ m/s
1 m/s	= 3.6 km/hr

**FORCE**

1 Newton	= $10^5$ dyne
1 dyne	= $10^{-5}$ Newton (N)
1 kg	= 9.81 N

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### PRESSURE

1 Pascal	= 1 N/m <sup>2</sup>	
1 atmospheric pressure (1 atm)	= 76 cm of Hg	
	= 760 mm of Hg	
	= 1.01325 × 10 <sup>6</sup> dynes/cm <sup>2</sup> (CGS unit)	
	= 1.01325 × 10 <sup>5</sup> N/m <sup>2</sup> (SI unit)	
	= 1.01325 × 10 <sup>5</sup> Pascal	
1 bar	= 1 atm	= 1.01 × 10 <sup>5</sup> Pa
1 Torr	= 1 mm of Hg	= 133.3 Pa

### DENSITY

$$1 \text{ gm/cm}^3 = 1000 \text{ kg/m}^3$$

### ENERGY, WORK, HEAT

1 kWh	= 3.6 × 10 <sup>6</sup> J	
1 cal	= 4.186 J	= 4.2 J (approx.)
1 erg	= 10 <sup>-7</sup> J	
1 J	= 10 <sup>7</sup> erg	
1 electron volt (eV)	= 1.6 × 10 <sup>-19</sup> J	

### POWER

1 W	= 1.341 × 10 <sup>-3</sup> HP	
1 KW	= 1.341 H.P.	
1 Horse Power	= 746 Watt	= 0.746 Kilowatt (KW)
1 Dioptre	= 1 m <sup>-1</sup> (Power of lens)	

### TEMPERATURE

Absolute Zero	= -273°C	
Kelvin scale (K)	= °C + 273	
1 Degree (1°)	= $\frac{\pi}{180}$ radian	

## B. Force and Motion

Force is a push or pull. It is an external agent, which changes or tries to change the position or state of the body from rest to motion and vice-versa. The principles of force and motion are applied to many things in our daily life. To perform any kinds of work we need force. For example, working, throwing, running and bicycling use force to produce motion.



### Distance and Displacement

The total length of the path travelled by an object in any direction is defined as distance. The shortest distance travelled by an object in a fixed direction is defined as displacement. The displacement has its magnitude and direction but the distance has only magnitude but no fixed direction.

### Scalar and Vector Quantity

The quantity, which specifies only its magnitude but no fixed direction, is termed as scalar quantity. For example, distance, speed, work, energy, power, temperature, current, large angles, etc. The quantity, which specifies both its magnitude and direction, is termed as vector quantity. For example, displacement, force, momentum, potential gradient, magnetic induction, electric dipole moment, etc.

### Speed

The distance covered by a body in a unit time is known as speed of a body. It is a scalar quantity.

$$\text{i.e. Speed} = \frac{\text{distance covered (length of actual path)}}{\text{time taken}}$$

### Acceleration

Acceleration is the rate of change of velocity per unit time. Object that change their speed or direction are said to be accelerating. The acceleration may be negative or positive. Negative acceleration is called as retardation or deceleration. Its unit is  $\text{m/s}^2$ .

$$\text{i.e. Acceleration} = \frac{\text{change in velocity}}{\text{time taken for the change}}$$

### Velocity

Velocity is the speed of an object along a given direction. It is a vector quantity.

$$\text{i.e. Velocity of a moving body} = \frac{\text{distance covered in a definite direction}}{\text{time taken to cover that distance}}$$

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When the body possesses uniform acceleration, then its average velocity is given as,

$$\text{i.e. Average velocity} = \frac{\text{Initial velocity} + \text{Final Velocity}}{2}$$

### Uniform Motion

If a body is in uniform motion (velocity = constant) then the path followed is a straight line and the motion is rectilinear motion. In uniform motion, body covers equal displacement in equal time interval.

### Inertia

Inertia is a property of all bodies by virtue of which they are unable to change their state of rest or uniform motion in a straight line without the help of external force. It is also defined as the tendency of a body to maintain its state of rest or uniform motion in a straight line. The property that a body at rest tends to maintain its own state of rest in absence of external force is known as inertia of rest. In addition, the property that a moving body tends to continue its state of uniform motion in a straight line is termed as inertia of motion.

### Equations of Motion

The distance traveled (s), initial velocity (u), final velocity (v), acceleration (a) and time taken (t) are related by the following equations;

- i.  $v = u + at$
- ii.  $s = \left(\frac{u+v}{2}\right) \times t$
- iii.  $v^2 = u^2 + 2as$
- iv.  $s = ut + \frac{1}{2} at^2$

### Newton's Laws of Motion

Isaac Newton proposed the three laws of motion that apply to every moving object. Newton's three laws of motion were published in the book "*Principia Mathematica Philosophiae Naturalis*" in 1686.

1. **First law of motion:** Newton's first law of motion states that, "everybody continues in its state of rest or uniform motion in a straight line unless it is compelled by some external force to change that state". First law gives the idea of inertia. Therefore, it is called as law of inertia. This law also gives the qualitative definition of force and is the condition of equilibrium of a body. For example, a book lying on the table lies there until eternity.
2. **Second law of motion:** Newton's second law of motion states that, "the acceleration produced in a body is directly proportional to the force applied and inversely proportional to the mass of the body".

i.e. acceleration (a)  $\propto$  force (F) ..... (i)

a  $\propto$  1/mass(m) ..... (ii)

Combining (i) and (ii), a  $\propto$  F/m

$$F \propto ma$$

$$F = kma$$

When, m = 1 kg, a = 1 m/s<sup>2</sup> and F = 1N

We get, k = 1

Thus, F = ma ..... (iii)

Hence, this law is used for the measurement of Force.

3. **Third law of motion:** Newton’s third law of motion states that, “to every action, there is always an equal and opposite reaction”. This law gives the property of force that exists in pair.

$$\text{i.e. } F_{AB} = - F_{BA}$$

### Impulse

Impulse of a force is defined as the change in momentum produced by the force and is equal to the product of force and time for which it acts.

$$\text{i.e. } F = ma$$

$$F = m (v-u)/t$$

$$F = mv - mu$$

Impulse = Change in momentum

### Gravity and Gravitation

The force by which the earth attracts all bodies towards itself is known as gravity. In other words, it is defined as the phenomenon of attraction of surrounding bodies towards the centre of particular body (planets, stars or massive bodies). It is the measure of weight of the body. i.e. W = mg. Gravity holds the atmosphere around the earth which is always directed towards the centre of the planet.

The mutual force of attraction between any two bodies is known as gravitation. Gravitational force is always attractive, conservative and central force depending upon the masses of the bodies but is independent of medium and presence of any other bodies nearby. It produces action and reaction and hence obeys Newton’s third law of motion. It depends on masses and distance between centre of bodies. It is weaker than nuclear, electric and magnetic forces but stronger than intermolecular force. It exists between any pair of the bodies throughout the universe.

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**Newton's Law of Gravitation:** It states that, 'everybody in the universe attracts every other body with a force that is directly proportional to the product of their masses and is inversely proportional to the square of distance between their centers'. This law is also called as Universal Law of Gravitational Constant.

$$\text{i.e. } F \propto m_1 m_2 \dots \dots \dots (i)$$

$$F \propto \frac{1}{d^2} \dots \dots \dots (ii)$$

Combining (i) and (ii)

$$F \propto \frac{m_1 m_2}{d^2}$$

$$F = \frac{G m_1 m_2}{d^2} \dots \dots \dots (iii)$$

Where, G is universal gravitational constant whose value is equal to  $6.67 \times 10^{-11} \text{ Nm}^2/\text{Kg}^2$ .

**Acceleration due to gravity:** The acceleration produced by the earth or other planets towards its centre is known as acceleration due to gravity. It is given as,

$$\text{i.e. Acceleration due to gravity (g)} = \frac{GM}{R^2}$$

Where, M is the mass of the planet and R is the radius of the planet.

The value of 'g' doesn't depend upon mass, size and shape of the body. 'g' is greater at poles than at equator.

### Momentum

Momentum is the total quality of a moving object. It is defined as the product of its mass and velocity. Momentum can be changed by changing the mass, velocity, or both after applying force. For example, a car moving at a high speed has a lot of momentum. A table tennis ball moving at the high speed has less momentum. Anything at rest has no momentum since its velocity is zero.

$$\text{i.e. Momentum } (\vec{P}) = m \vec{v}$$

### Friction

The opposing force which comes into play between the surfaces of two bodies when one of them is pulled over the surface of other is called as Friction. And the work done by frictional force is always negative. It is of three types: static friction, limiting friction and kinetic friction. Static friction acts on stationary objects, while kinetic friction acts on moving object. Moreover, the maximum value of static friction is limiting friction. The strength of frictional force depends on the nature of the surface that is in contact between the object. Example, A ball rolls on a rough surface and a chain cycle work on friction.

## C. Pressure

The force acting per unit area is called pressure. In our daily life we have many experiences of pressure sometime we have to apply pressure and sometime pressure is applied to us. Pressure increases, with increase of force and decrease in area of contact. For example, you fill easier to cut an apple with a sharp knife then with a blunt one.



### Vapour Pressure

The pressure exhibited by vapor present above a liquid surface is known as vapour pressure. A substance with a high vapor pressure at normal temperatures is often referred to as volatile. As the temperature of a liquid increase, the kinetic energy of its molecules also increases. As the kinetic energy of the molecules increases, the number of molecules transitioning into a vapour also increases, thereby increasing the vapour pressure.

The normal boiling point of a liquid (also known as the atmospheric pressure boiling point) is the temperature at which the vapor pressure equals the atmospheric pressure. With any incremental increase in that temperature, the vapor pressure becomes sufficient to overcome atmospheric pressure and lift the liquid to form vapor bubbles inside the bulk of the substance. Bubble formation deeper in the liquid requires a higher pressure, and therefore higher temperature, because the fluid pressure increases above the atmospheric pressure as the depth increases.

### Atmospheric Pressure

Atmospheric pressure, sometimes also called barometric pressure, is the pressure exerted by the weight of air in the atmosphere of Earth (or that of another planet). In most circumstances, atmospheric pressure is closely approximated by the hydrostatic pressure caused by the weight of air above the measurement point. Low-pressure areas have less atmospheric mass above their location, whereas high-pressure areas have more atmospheric mass above their location. Likewise, as elevation increases, there is less overlying atmospheric mass, so that atmospheric pressure decreases with increasing elevation.



### Liquid Pressure

The pressure exerted by liquid is said to be liquid pressure. It increases with the increase in depth. So, the bottom of a dam is made wide and thick. And a deep diver wears a safety suits. The pressure at the base of a liquid column of density ( $\rho$ ) and height (h) is given by,  $P = h\rho g$ . Pressure acts equally in all possible directions. Liquid pressure is always perpendicular to surface area.

The pressure exerted by atmospheric air is said to be atmospheric pressure. It decreases with increase in altitude.

### Surface Tension

It is the property of liquid by virtue of which it occupies minimum surface area. It is given by force per unit length. At critical temperature, surface tension becomes zero.

$$\text{Mathematically, Surface Tension (T) = } \frac{\text{Force(F)}}{\text{Length(l)}}$$

### Viscosity

The property of fluid in motion by virtue of which it opposes relative motion between different layers and it opposes motion of another body through that fluid is known as viscosity. Viscosity of liquids decreases with increase in temperature but increases with increase in density. And the viscous force arises due to electromagnetic interaction.

**Principle of Flotation:** It states that, 'an object floats in a liquid medium only when it displaces the liquid at equal to its weight.'

**Archimedes' Principle:** It states that when a body is immersed partly or wholly in a liquid at rest, it loses some of its weight, which is equal to the weight of liquid displaced by the immersed part of the body.

$$\text{Decrease in weight} = \text{Upthrust} = \text{Weight of fluid displaced}$$

**Upthrust:** It is an upward force acting on the body immersed in a liquid. It depends on density of fluid, acceleration due to gravity, volume of the body inside the fluid but is independent of all factors of body such as its mass, density, size and shape.

## D. Work, Energy and Power



Work is said to be done when some force is applied on an object and the applied force tends to move the object. Varieties of activities are performed in everyday life such as playing, ploughing, washing, carrying loads etc that we call as work in our daily life. Force is needed to perform any work with the coverage of distance. Therefore, work done is equal to the product of the force applied and distance moved by the body in the direction of the force. Work done are of two types; work done against the gravity and work done against the frictional force.

Work done is positive when the angle lies between  $0^\circ$  and  $90^\circ$ . And work done is negative when the angle lies between  $90^\circ$  and  $180^\circ$ . For example, work done by friction is negative. Similarly, when a body is thrown up, the work by gravitational pull is negative. When the angle is equal to  $90^\circ$ , work done is zero. (i.e.  $W = F_s \cos\theta$ )

For example;

- i. Work done by centripetal force in displacing a particle a particle long a circular path is zero.
- ii. Work done by centripetal force (i.e. gravitational pull) in revolving satellite around the earth is zero.
- iii. When a person carrying load on his head moves over a horizontal road, work done against the gravitational force is zero.
- iv. When a car moves with a uniform speed over a frictionless road, work done is zero.

Whenever the work is done **by a body**, the work is positive and the energy **decreases**. Whenever the work is done **on a body**, the work is negative and the energy **increases**. Work done by the body doesn't depend on the time taken to complete the work.

**Work and Energy are said to be equivalent according to Work-Energy theorem.**

**i.e.  $W = \text{Change in KE}$**

### **Energy**

Energy is the capacity of an object to do work. There are several forms of energy found in the nature such as mechanical, chemical, heat, light, magnetic, sound, thermal, electric, tidal, fossil fuel, nuclear energy, etc. The energy possessed by body due to motion or configuration is known as mechanical energy. Kinetic energy and potential energy are the mechanical energy. Energy can neither be created nor be destroyed; the total amount of energy in the universe always remains constant. However, it can be transformed from one another. This is called the law of conservation of energy.

**Kinetic Energy and Potential Energy:** Kinetic energy is the energy possessed by an object due to its motion. All moving objects have kinetic energy. The amount of kinetic energy depends up on the mass of the object and the speed or which it is travelling. A fast moving car has kinetic energy than as low moving car.

$$\text{i.e. K.E.} = \frac{1}{2} mv^2 = \frac{m^2v^2}{2m} = \frac{p^2}{2m} \quad [P \text{ is the momentum}]$$

Potential energy is the energy possessed by an object due to its position or configuration. The amount of potential energy of an object depends on its mass and height. For example- If you stretch a rubber band, you will give it potential energy. As a rubber band is released, potential energy is converted into kinetic. When a body of mass (m) is raised to a height (h) from earth surface then,

$$\text{Change in P.E.} = mgh$$

$$\text{Or Simply, P.E} = mgh$$

**Renewable and Non-renewable energy:** Renewable energy is the energy obtained from sources that cannot be exhausted. It can be used over and over again. The sources of renewable energy occur and re-occur naturally in the environment. Some renewable energy are solar energy, hydro energy, wind energy, geothermal energy and biomass energy. Renewable energy can also converted into other forms of energy.

Non-renewable energy is the energy that can be used only once. Non-renewable sources of energy include coal, natural gas, oil and uranium. They can exist in limited quantities on earth. The use of most non-renewable sources of energy like oil, gas and produce green house gases.

## Power

Power is defined as the rate of doing work which is also known as the rate of change of energy. Power is dissipated only by the tangential component of force and not by the normal/radial component of force.

$$\text{i.e. Power (P)} = \frac{\text{Workdone (W)}}{\text{Time (T)}} = \frac{F \times s}{t}$$

$$\text{Also, Power} = \text{Force} \times \text{Velocity} = Fv \cos \theta$$

$$\text{Rate of change of energy, (P)} = \frac{\Delta E}{t}$$

The practical unit of power is horse power (HP); 1 HP = 746 Watt.

## Collision

The phenomena of mutual interaction between particles for short interval of time in which their momentum and kinetic energy be changed is collision. Collision is of five types;

- i. **Elastic collision:** kinetic energy is conserved.
- ii. **Inelastic collision:** kinetic energy is not conserved.
- iii. **Perfectly inelastic collision:** if entire kinetic energy of body is conserved to another form of energy after collision.
- iv. **Head on collision:** particles move in same straight line before and after collision.
- v. **Oblique collision:** particles do not move in same straight line.

The law of collision states, the velocity of separation between particles after collision is directly proportional to velocity of approach of these particles before collision.

$$\text{i.e. } v_2 - v_1 \propto u_1 - u_2$$

$$v_2 - v_1 = e (u_1 - u_2)$$

Where,  $(u_1 - u_2)$  = velocity of approach

$(v_2 - v_1)$  = velocity of separation and 'e' is coefficient of restitution

## E. Light

Light is a form of energy, which when falls on objects, enables us to see them. It is an electromagnetic radiation, which can be detected by the human eye. Light travels at a constant speed. We see everything around us by light. Light itself is invisible but makes other things visible. When we say that we can see something we are, in fact seeing light reflected from the objects that reach our eyes. Light travels in a straight line and bounces off a mirror much like a ball bouncing off a wall.



The speed of light is not always constant and changes according to the medium through which it is travelling. It is the greatest in a vacuum. It slows down when passing through water. It slows even further when passing through glass.

### Optics

Optics is the scientific study of light. It is a branch of physics that describes the behavior and properties of light and interaction of light with matter. In other words, the branch of physics which deals with the study of light, its transmission, generation and detection is known as optics. Optics explains all kinds of optical phenomena.

### Prism

A prism is a wedge shaped block of glass having three rectangular faces and two triangular faces. When light passes through a prism, it separates the light into a rainbow of colors. The prism is used in laboratories to demonstrate that white light is composed of different colors.

### Rainbow

A rainbow is an arc of colored bands in the sky. It is caused by the reflection of sun's rays. It generally occurs on a rainy day. Rainbows appear when sunlight passes through small droplets of water suspended in the atmosphere. Each droplet acts as a prism and splits the sunlight into its seven component colors. These colors are violet, indigo, blue, green, yellow, orange, and red. The commonly used acronym for the colors of a rainbow is VIBGYOR.

**Shadow**

Light travels in a straight line. Any opaque objects that blocks light will cast a shadow. A shadow is a dark area that forms on the opposite side of light source. If the source of light is smaller than the object, the shadow formed will be evenly dark. A wide source of light creates a shadow with a dark centre called the umbra. A lighter region called the penumbra surrounds the umbra.

Even objects seem transparent can also cast shadows. This can happen if they reflect or absorb some of the light striking them. A shadow will move if either the object or light source is moved.

**Reflection and Refraction**

Reflection is the phenomenon of returning back of light in same medium when light incidents on a polished surface. On reflection, speed, frequency and wavelength of light remain unchanged while amplitude and intensity decreases on reflection.

**Laws of Reflection:**

- i. The angle of incidence is equal to the angle of reflection. i.e.  $i = r$
- ii. The incident ray, the reflected ray and the normal to the point of incidence all lie on the same plane.

Refraction is the change in the direction of light when it passes one medium to another. It is accompanied by a change in the speed and wavelength of light because light travels faster in rarer medium then in denser medium. While passing from denser to rarer medium, refractive ray bends away from normal and from rarer to denser medium, towards the normal.

**Laws of Refraction:**

- i. The incident ray, the refracted ray and the normal all lie on the same plane.
- ii. The ratio of sine of angle of incidence to the sine of angle of refraction is constant for a particular pair of media. This is also called as Snell's Law.

$$\text{i.e. } \frac{\sin i}{\sin r} = \text{constant} = \mu \text{ (where '}\mu\text{' is called refractive index.)}$$

**Refractive index ( $\mu$ ):** It is defined as the ratio of speed of light in vacuum to the speed of light in medium i.e.  $\mu = \frac{c}{v}$  Where,  $c$  is speed of light in vacuum and  $v$  is speed of light in medium.

### Total Internal Reflection

When angle of incidence travelling from denser to rarer medium is greater than the critical angle, no refraction occurs. The incident ray is reflected back in the same medium, this phenomenon is called total internal reflection. Thus, for total internal reflection; light should travel from denser to rarer medium and the angle of incidence must be greater than critical angle (C). i.e.  $i > C$

**Critical Angle:** When a ray of light is travelling from denser to rarer medium, the angle of incidence for which the angle of refraction becomes  $90^\circ$  is called critical angle.

### Velocity of Light

Different methods are used in determination of velocity of light like; Fizeau's Method, Foucault's Method, Michelson's Method and more. In free space (vacuum), the velocity of light is  $3 \times 10^8$  m/s. In isotropic optical medium, velocity of light is same in all directions. E.g, water, air, glass. And in anisotropic optical medium, velocity of light differs in different directions.

- Objects are visible from all directions due to scattering of light.
- Light travels more slowly in water than in air.
- Light appears to travel in straight lines because the wavelength of length is very small.
- The color of light depends on its wavelength.
- On refraction, both velocity and wavelength change but frequency doesn't.
- All color of light has same speed on vacuum but red light has maximum speed and violet light has minimum speed in medium.

### Human Eye

Human eye consists of a biconvex lens of varying focal length. Focal length is changed by ciliary muscles attached with the lens. The process of forming image of object at any distance on fixed retina by changing the focal length of eye lens is known as accommodation of eye.

The retina of human eye is similar to film/screen of camera while iris to diaphragm of camera. Similarly, the pupil is similar to aperture and eyelid to shutter of the camera. The retina forms inverted and real image of object. Human eye is most sensitive to yellowish green light. Far point for human eye is infinity and near point is 25cm. Maximum refraction takes place at cornea and it constitutes the maximum power of eye i.e. 45D.

**Defects of Vision:**

**Myopia/Short Sightedness:** The person suffering from myopia can see the nearer objects but cannot see the far objects and the image is formed in front of the retina. The causes of myopia are; elongation of eyeball and decrease in the focal length of eye lens. Myopia can be corrected by using concave lens which focal length is equal to the far point of the myopic eye.

$$\text{i.e. } \frac{1}{f} = \frac{1}{u} + \frac{1}{-v} = \frac{1}{\infty} - \frac{1}{v}$$

$$\therefore f = -v$$

Where, f is the focal length, u is the object distance and v is the image distance.

**Hypermetropia/Long Sightedness:** The person suffering from hypermetropia can see only the far object and the image is formed behind the retina. The causes of hypermetropia are; contraction of eyeball and increase in focal length of eye lens. Hypermetropic eye can be corrected by using convex lens or converging lens.

$$\text{i.e. } \frac{1}{f} = \frac{1}{D} - \frac{1}{x}$$

Where, D is the least distance of distinct vision and x is the near point.

**Presbyopia:** The person suffering from presbyopia can see neither very nearer objects nor very far objects. It is caused due to the loss in compressibility of eye lens and ciliary muscles and it is the sign of old age. Presbyopia leads to gradual decrease in power of the accommodation. It can be corrected by using bifocal lens with lower part concave and upper part convex.

**Astigmatism:** It is caused due to the unequal curvature of the cornea. Astigmatism is corrected by using cylindrical or sphero-cylindrical lenses.

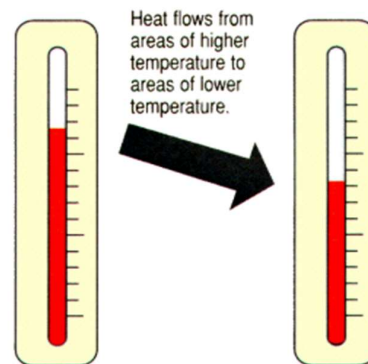
**Resolving Power:** The ability of an optical instrument to separate the images of two closely placed objects is known as resolving power. The resolving power of human eye is 1 minute. Human eye fails to distinguish between two points separately if they subtend an angle equal to or less than 1 minute.



## F. Heat

Heat is a form of energy transfer, which is the total sum of kinetic energy of a molecule. There are many sources of heat. Heat is transferred from one object to another due to the differences in their temperature.

Energy is transferred from substances at a higher temperature to substances at a lower temperature. The heat in earth comes from six main sources: the sun, the earth, chemical reactions, nuclear energy, friction and electricity.



### Transmission of Heat

Heat transfer takes place in three different ways: conduction, convection and radiation.

**Conduction:** It is the slowest process of transmission of heat, takes place in solid and the path followed in conduction is irregular. During conduction, only energy is transferred but not the mass and momentum.

**Convection:** It is the faster process than conduction, takes place in liquid and gases and the path followed is irregular.

**Radiation:** It is the fastest mode of heat transmission, heat transfers with the speed of light. No medium is required for radiation. During radiation, heat is transferred in the form of electromagnetic wave.

### Measurement of Heat

The three units most commonly used to measure heat are British Thermal Unit (BTU), calorie, and joule. One BTU is the quantity of heat needed to raise the temperature of 1 pound of water by 1°F. One calorie is the quantity of heat needed to raise the temperature of 1 gram of water by 1°C. Joule is the SI unit of energy that is equal to 0.2390 calories and 0.000948 BTU. Heat capacity is the amount of energy required to raise the temperature of an object by 1°C.

### Thermodynamics

Thermodynamics is the scientific study of heat and energy flow. It is the branch of physics, which explain the conversion of heat into mechanical work and vice-versa. There are three laws of thermodynamics. The first law of thermodynamics often called

the Law of Conservation of Energy, states that the total amount of energy available in the universe is constant. The second Law of thermodynamics states that heat cannot be transferred from a colder body to a hotter body. The third law of thermodynamics states that if all the kinetic energy of molecules could be removed, a state called absolute zero would occur. Absolute zero results in a temperature of 0 Kelvin or  $-273.15^{\circ}\text{C}$ .

The Zeroth Law of Thermodynamics states when two bodies A and B are in thermal equilibrium with a third body C separately then these two bodies A and B will also be in thermal equilibrium with one another.

### **Temperature**

Temperature is the degree of hotness or coldness of an object. Temperature is also a measure of the average translational kinetic energy or how fast the atoms and molecules of a substance are moving. It determines the direction of flow of heat. The temperature of an object is measured using a thermometer marked in degrees on the Fahrenheit, Celsius, or Kelvin scales. The measurement of temperature of a body is based on the principle of thermal equilibrium.

The production and measurement of very low temperature less than 77K is known as Cryogenics. And the production and measurement of very high temperature i.e.  $> 1000\text{K}$  is known as Pyrometry.

### **Thermal Equilibrium**

A system is said to be in thermal equilibrium if there is no net heat exchange between it and its surroundings. The movement of atoms or molecules within an object gives it internal energy. The more the internal energy of an object, the hotter it is. If a high-energy atom is exposed to a low-energy atom, the high-energy atom will lose some of its energy to the low-energy atom. The two atoms will eventually have a common energy level, which is called thermal equilibrium. Once thermal equilibrium is reached, no heat transfer takes place from one object to another.

Two bodies are said to be in thermal equilibrium with each other when no heat flows from one body to another body i.e. when these bodies are at the same temperature.

### **Thermometer**

Thermometer is a device to measure the temperature of the body. On the basis of thermometric substances, thermometers are of three types; Solid, Liquid and Gas thermometers. Liquid thermometer is based on the principle of change in volume with rise in temperature. Mercury and Alcohol thermometers are liquid thermometers. Platinum resistance thermometer, Radiation pyrometer, Magnetic thermometer,

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thermometer are solid thermometers. Constant volume hydrogen gas, vapor pressure thermometers are gas thermometers.

Gas thermometers are more sensitive than liquid and solid thermometers because expansion of gas is more than that of liquid and solids. Liquid thermometric substances have low specific heat, high thermal conductivity and constant coefficient of expansion for large range of temperature.

Mercury is preferred over other liquid because its expansion is large and uniform and it has high thermal conductivity and low specific heat moreover alcohol thermometer is better than mercury because alcohol expands greater than mercury and greater the expansion, more is the accuracy. To measure temperature most accurately, we use constant volume gas thermometer.

### Fundamental Interval on different scales

S.N.	Temperature Scales	Symbol	LFP	UFP	No.of divisions
1.	Celsius	°C	0°C	100°C	100
2.	Fahrenheit	°F	32°F	212°F	180
3.	Reaumer	°R	0°R	80°R	80
4.	Rankine	°R <sub>n</sub>	492°R <sub>n</sub>	672°R <sub>n</sub>	180
5.	Kelvin	K	273.15K	373.15K	100

The temperatures on different temperature scales are related as,

$$\frac{C - 0}{100 - 0} = \frac{F - 32}{212 - 32} = \frac{R - 0}{80 - 0} = \frac{R_n - 492}{672 - 492} = \frac{K - 273.15}{373.15 - 273.15}$$

$$\text{i.e. } \frac{C}{100} = \frac{F-32}{180} = \frac{R}{80} = \frac{R_n-492}{180} = \frac{K-273.15}{100}$$

Celsius and Fahrenheit scale give common reading at  $-40^\circ$  ( $-40^\circ\text{C} = -40^\circ\text{F}$ ). Celsius and Reaumer scale give common reading at  $0^\circ$  ( $0^\circ\text{C} = 0^\circ\text{R}$ ). But, Celsius and Kelvin scale never give common reading. Also, Fahrenheit and Rankine scale never give common reading. Kelvin scale has no negative temperature. Absolute Zero temperature is equal to  $0\text{K} = -273.15^\circ\text{C}$ .

## G. Sound and Music

Sound is a form of energy caused by vibration. It needs a medium to move and it cannot travel through a vacuum. It travels through solids, liquids, or gases in the form of waves. It is present all round us, from the ringing of a telephone to the sound of the heart beat.

Sound can be observed by the sense of hearing. Humans and other animals use their ears to hear the sound. Humans can hear sounds frequency between 20Hz and 20,000Hz. The eardrums convert the vibrations into signals. The signals travel along nerves to the brain. The brain interprets them as voice, music, or noise. The sweetness of sound depends upon its periodicity and regularity.



### Sound Waves

Sound waves are mechanical waves. They cannot travel in vacuum. If no sound medium is present, there can be no sound. There is no sound in outer space as it does not have any sound medium. The air molecules, through which they travel, vibrate parallel to the direction of the sound waves. Such waves are called longitudinal waves. Sound waves are transported from one place to another by means of particle interaction. They spread out from a source in all directions, just like ripples spread from a stone thrown into a pond. The more they spread out, the weaker they become.

Wave produced in water is 2- Dimensional

Wave produced in string is 1- Dimensional

Sound and light wave is 3- Dimensional

### Types of wave

- 1. Transverse wave:** In this type of wave vibration is perpendicular to the propagation of wave.
- 2. Longitudinal wave:** In this type of wave vibration is parallel to the propagation of wave.

These waves require material medium for their propagation.

### Frequency and Amplitude

Frequency and Amplitude are physical characteristics of sound. Frequency is the measurement of the number of occurrences of a repeated event per unit of time. It is

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also defined as the number of cycles of sound waves per unit time. It describes how many pulses of sound waves enter our ear in a single second. The frequency of sound wave is measured in Hertz (Hz). Frequency depends upon the source but not on the medium. Pitch is the perceived as fundamental frequency of a sound.

$$\text{i.e. } f = \frac{1}{T}$$

The size of the sound wave is called its amplitude. Amplitude is the measure of power or strength of sound wave. Large amplitude represents a loud sound while smaller amplitude represents a softer sound. Frequency does not change when a wave travels from one medium to other.

### Oscillation and Time period

Oscillation is defined as one complete to and fro motion of the vibrating particles and time period is defined as the time taken by the vibrating particles to complete one oscillation. Both inertia and elasticity determine the frequency of natural oscillation of the system.

### Resonance

If a body is made to vibrate by some external force and the natural frequency of the body is equal to that of vibrator, the body vibrates with maximum amplitude and the intensity of sound becomes maximum. This phenomenon is termed as resonance. It is special type of forced vibration. Due to resonance, soldiers are not allowed to march in step on a hanging bridge.

### Music

Music is the art of sound. It is the organized and rhythmical creation of sound that is pleasing to the ear. Music expresses a wide variety of human emotions. It includes various styles such as instrumental, vocal, dramatic, electronic, and compositional. It is originated on many different levels such as notes, rhythms, textures, and phrases. Melody is the musical organized into anything, from a simple song to a complex symphony.

A musical sound consists of a quick succession of regular and periodic rarefaction and compression without any sudden change in amplitude. A tone is a musical sound of a single frequency and a note is a musical sound consisting of two or more tones. The tone with the lowest frequency is called fundamental tone. Except the fundamental tone, the remaining tones in a note are called overtones.

### **Characteristics of Musical Sound**

**Pitch:** It depends directly on the frequency of incident sound waves and helps to distinguish between a shrill or grave sound. Higher the frequency, higher is the pitch and shriller sound is heard. Similarly, lower the frequency, lower is the pitch and grave sound is produced. The humming of a mosquito or buzzing of a bee has high pitch but low loudness while the roaring of a lion has large loudness but low pitch. Pitch of female voice is higher than that of male due to presence of more harmonics.

**Loudness:** It is the sensation received by our ear due to the intensity of sound. The unit of loudness is phon which is equal to the intensity level in dB of equally loud sound of 1 KHz.

**Quality or Timbre:** It is the sensation received by our ears due to waveform is known as quality or timbre. It enables us to distinguish between two sounds having same intensity (or loudness) and frequency (or pitch). It depends on presence of overtones. Qualities of two sounds are different because of different overtones. One can recognize a person without seeing him and can distinguish the same note played on different instruments say gitar and veena due to different quality.

### **Echoes**

Echo is the sound heard after reflection from an obstacle. When sound hits a hard surface it may bounce back. Hard surfaces reflect sound well, while soft surfaces, such as cloth or wood absorb sound. If the surface is very far from the source of the sound, we hear the reflected sound after the original sound as an echo. Echoes usually occur when sounds in air meet solids. They can also occur when solid in a liquid hits a solid.

### **Reverberation**

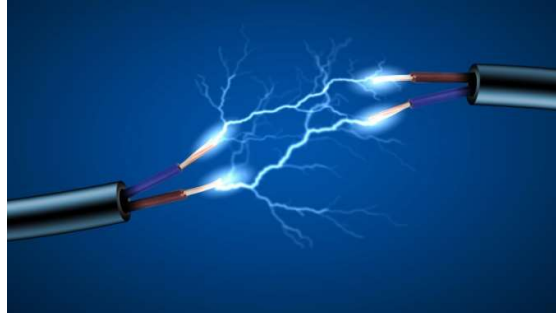
When sound is produced in a room or hall, it is reflected number of times by wall, floor, ceiling and objects in the room. Hence same sound is heard continuously for longer time. This is called reverberation. For good audibility, the reverberation time is 1 sec.

### **Noise**

The sound intensity more than 100 dB is termed as noise. The sound of 130 dB is painful and may cause hearing impairment. In addition, the sensation received by our ears due to intensity of sound is loudness. A noise consist of slow succession of irregular and a periodic rarefactions and compressions accompanied by sudden change in amplitude.

## H. Electricity

Electricity is a form of energy. It is the movement of electrons or protons in a material. Electrons are negatively charged atomic particles, while protons are positively charged. Electrons in a conductor move from a negatively charged point to a positively charged point.



Electricity is present everywhere in the world. Lighting is a form of electricity produced by clouds. Even the human body contains weak electric signals that flow in the nerve cells. Electricity can be changed into other forms of energy, such as heat and light. It is used to produce light, heat, power, etc.

### Electric Current

Electric current is the flow of charge in a definite direction through a wire. It is due to the flow of both positive and negative charges. Charge can flow only through a conductor. Therefore, electricity can flow only through a conductor. There are two types of electric current- direct current and alternating current. Direct current flows only in one direction while alternating current reverses its direction at regular intervals.

If  $q$  coulombs of charge flow through a section of a wire in  $t$  sec, the current through the wire ( $I$ ) is given by,

$$\text{i.e. } I = \frac{q}{t} \text{ amperes}$$

**Current Density:** Current density at a point inside the conductor is the amount of current flowing per unit area around that point of the conductor, provided the area is held in a direction normal to the current. It is a characteristic property of a particular point inside the conductor and not the whole conductor.

**Resistance:** Resistance is the obstruction possessed by the conductor to the flow of current through it. The resistance of a given conductor at a constant temperature is directly proportional to its length and inversely proportional to its area. It depends upon the temperature, nature and dimensions of the material of the conductor.

**Ohm's Law:** It states that, 'at constant temperature and other physical quantities, the current flowing through a conductor is directly proportional to the potential differences

across the ends of a conductor.' Ohms law is valid only for metallic conductors and electrolytes obey the law at high potential.

i.e.  $I \propto V$

$$I = \frac{1}{R} \cdot V$$

$V = I R$  (Where, R is the resistance of the conductor.)

### Heating Effect of Current

**Joule's Law of Heating:** When a current is passed through a resistance, heat is produced. This is known as Joule's heating effect of electric current. According to the law, the amount of heat produced (H) in a conductor is directly proportional to

- i. Square of the current (I) flowing through the conductor.
- ii. Resistance (R) of the conductor.
- iii. Time (t) for which the current is passed.

Thus,  $H = I^2 R t$

The Joule's heating effect can also be explained as the transformation of electric energy into heat when current is set through the electrical resistance of the conductor.

**Electric Power:** It is defined as the rate at which work is done by the source of emf in maintaining the current in the electric circuit.

$$\text{i.e. Electric Power (P)} = \frac{\text{Workdone}}{\text{Time}} = \frac{qV}{t} = I V$$

$$\therefore P = V I = I^2 R = \frac{V^2}{R}$$

**Electric Energy:** It is defined as the total work done or energy supplied by the source of emf in maintaining the current in an electric circuit for a given time.

i.e. Electric Energy = Electric Power  $\times$  Time

### Chemical Effect of Current

The vessel containing electrodes and electrolytes in which the electrolysis is carried out is called voltameter.

#### Faraday's Laws of Electrolysis

**First Law:** It states that the mass of the substance liberated or deposited at an electrode during electrolysis is directly proportional to the quantity of charge passed through the electrolytes.



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i.e.  $m \propto q$

$$m = zq = z It$$

Where,  $z$  is the Electro Chemical Equivalent (E.C.E) of the substance. ECE of a substance is defined as the mass of substance liberated or deposited on an electrode during electrolysis, when one coulomb charge (or 1 ampere current for 1 second) is passed through the electrolyte.

**Second Law:** It states that when the same amount of charge is passed through different electrolytes, the masses of the substances liberated or deposited at the various electrodes are proportional to their chemical equivalents

i.e.  $m \propto E$  (Where,  $E$  is the chemical equivalent.)

$$\frac{m_1}{m_2} = \frac{E_1}{E_2}$$

Where,  $m_1$  and  $m_2$  are the masses of the substances liberated or deposited on electrodes during electrolysis and  $E_1$  and  $E_2$  are their chemical equivalents.

**Electroplating:** It is a process of depositing a thin layer of one metal over another metal by the method of electrolytes. By the process of electroplating, the articles of cheap metals are coated with the precious metals like silver and gold to make their look more attractive.

### Electric Circuit

Electric circuit is the path for the flow of electric current. Circuits are of two types: serial circuit and parallel circuit. Serial circuit is a circuit in which all the parts of the circuit are connected in a series. Parallel circuit is a circuit in which all the parts are split into branches.

### Production of Electricity

Electricity is generated in power plants. These power plants have huge electric generators that run on coal, natural gas, oil, nuclear power, hydroelectric power, and other natural sources to generate electricity. The electricity produced is distributed to industries and homes.

Electricity can also be produced in different ways like:

- Rubbing wax with wool produces electricity by friction.
- Electricity can be produced by chemical action as a storage battery.
- Electric motor or generator produces electricity by induction.

### **Types of Electricity**

There are two types of electricity – static electricity and current electricity. Static electricity is electricity at rest while current electricity is electricity in motion. Static electricity builds up on the surface of a material. It does not flow like current electricity. It can be created by rubbing two dissimilar materials together. The friction between materials causes the electrons to jump from one material and deposit themselves on the other.

### **Measurement of Electricity**

Electricity is measured in a unit of power called watt. It is named in honour of James watt, the Scottish inventor. Since a single watt is a very small unit of power, electricity is measured in kilowatt. A kilowatt is equal to 1000 watts. The amount of electricity generated by a power plant or used by an electric appliance is measured in kilowatt hours (kWh). One kWh is equal to the energy of 1000 watts used for one hour.

### **Conductors and Insulators**

Conductors are materials that allow the flow of electric current. Insulators are materials that do not allow the flow of current. Some examples of conductors are copper, silver, gold, aluminum, iron, steel, mercury, graphite, and water containing dissolved materials. Some examples of insulators are plastics, Styrofoam, paper, ceramics, rubber, glass, dry air, and very pure water.

## I. Magnetism

Magnetism is the property of a material to exert an attractive or repulsive force on another material. Materials having such property are called magnets. Magnets attract materials like iron, mineral lodestone, nickel, some steel, and cobalt. Such materials are called magnetic substances. These substances help detect the existence of magnetic force.

The property of magnetism can be temporary or permanent. It makes the magnets either temporary or permanent. Temporary magnetic retain magnetic properties for short periods while permanent magnets retain magnetism for a longer period.



### Electromagnetism

Electromagnetism is one of the fundamental forces of nature. It determines the ways in which electrically charged particles interact with each other and also with magnetic fields. Electricity and magnetism are combined in the force of electromagnetism. The magnetic force produced by the electric currents running along a wire and electricity is produced by rotating magnets around a wire. Electromagnetism governs electromagnetic radiations like radio waves, X-rays, and gamma rays. It also binds negatively charged electrons to positively charged nuclei.

**Electromagnetic Induction:** It is the phenomenon of generating an emf by changing the number of magnetic lines of force associated with a circuit. The emf so generated is called induced emf and the corresponding current is called induced current.

**Magnetic Flux:** It is the number of magnetic lines of force crossing a surface normally. It is denoted by ' $\phi$ ' and SI unit is Weber.

#### Faraday's Laws of Electromagnetic Induction

**First Law:** Whenever there is a change in the magnetic flux linked with a coil, an induced emf is produced in the coil. There is an induced current only when coil circuit is complete. The induced emf lasts so long as the change in the flux takes places.

**Second Law:** The magnitude of emf induced in a circuit is directly proportional to the rate of change of magnetic flux linked with the circuit.

## **Magnets**

Some pieces of metals or stones have an invisible natural force that attract or repels certain materials. They are called magnets. They are mainly of two types: permanent and temporary. A permanent magnet is one, which stays magnetized for a long time. It is also called a hard magnet. Permanent magnets (such as mineral lodestone) occur naturally in some rocks. Temporary magnets are made of materials like iron and nickel. They usually do not retain their magnetism outside a strong magnetic field. Therefore, they are also called soft magnets. Electromagnets are soft magnets produced by electric current.

## **Magnetic Poles**

All magnets have two poles North and South Pole. Like poles repel each other while the unlike poles attract. Therefore, the north pole of one magnet attracts the south pole of another magnet and repels the north pole of another magnet. Similarly, the south pole of one magnet attracts the north pole of another magnet and repels the south pole of another magnet. When a magnet is suspended freely it comes to rest along north-south direction. The pole which points the geographical north is called North Pole (N) and the pole which points the geographical south is called South Pole (S). Pole of magnet exists always in poles.

## **Magnetic Effect of Current**

Magnetic effect is a phenomenon by virtue of which an electric current in a conductor produces a magnetic field around it. This effect was first discovered by Oersted. The direction of magnetic field produced depends upon the direction of current in the conductor. When an electric current is passing through a conductor only magnetic field is associated with the conductor but there is no electric field, since the conductor is electrically neutral. And when an electric charge is moving in free space, both electric and magnetic fields are produced, whereas a static charge produces only electric field. It means, a stationary charge cannot produce a magnetic field.

## **Magnetic Field**

Magnetic field is a region outside the magnet where its magnetic effect/forces can be detected. It is caused by moving electrically charged particles. Magnets have a strong magnetic field especially at the poles of a magnet. The current carrying conductor is electrically neutral but a magnetic field is associated with it. The sources of magnetic fields are current carrying conductor, changing electric field, moving charged particle, permanent electromagnet, etc. A magnetic field interacts with the moving charges only. For stationary charges, its effect is zero.

## J. Scientific Instruments Used in Physics

- **Aerometer** : To measure the force and velocity of winds
- **Altimeter** : To measure the height
- **Ammeter** : To measure the strength of flowing electric current
- **Barometer/Manometer**: To measure atmospheric pressure
- **Binocular** : To see distant object by both eyes
- **Calorimeter** : To measure the amount of heat
- **Capacitor**: To store charge
- **Cardiograph** : To record the speed of heart beat
- **Cresco graph** : To record the growth of a plant
- **Dynamometer** : To measure electric energy
- **ECG**: To measure the electrical activity of heart
- **EEG**: To measure the electrical activity of brain
- **Episcope** : To see three dimensional picture
- **Fathometer** : To measure the depth of the sea
- **Fluoroscope** : To view objects by the means of x-rays
- **Generator**: To convert mechanical energy into electric energy
- **Hydrometer** : To measure the density or specific gravity of a liquid
- **Hygrometer**: To measure the relative humidity of the atmosphere
- **Kaleidoscope** : To multiply the images
- **Lactometer** : To measure the purity of milk
- **Micrometer** : To measure small distance and angles
- **Microscope** : To magnify the tiny object
- **Ohmmeter**: To measure the resistance of a substance
- **Periscope** : To see above the surface of the sea
- **Potentiometer** : To measure the differences in electrical potential
- **Richter scale**: To measure earth quake
- **Seismograph** : To record the intensity and origin of earthquake shocks
- **Speedometer** : To measure the velocity or speed
- **Sphygmomanometer** : To measure the blood pressure
- **Stethoscope** : To find the sound of heart
- **Stroboscope** : To view moving objects
- **Telescope** : To view distant object as magnified
- **Thermometer** : To measure the body temperature
- **Transformer** : To change the voltage of current
- **Wattmeter**: To measure the power of an electric circuit

**K. Astronomical and Physical Constants used in Physics**

✓ Mass of the sun ( $M_s$ )	$2 \times 10^{30}$ kg
✓ Radius of the sun ( $R_s$ )	$7 \times 10^8$ m
✓ Mass of the earth ( $M_e$ )	$6 \times 10^{24}$ kg
✓ Radius of the earth ( $R_e$ )	$6.4 \times 10^6$ m
✓ Mass of the moon ( $M_m$ )	$7 \times 10^{22}$ kg
✓ Radius of the moon ( $R_m$ )	$1.74 \times 10^6$ m
✓ Mass of universe ( $M_u$ )	$10^{53}$ kg
✓ Radius of universe ( $R_u$ )	$10^{26}$ m
✓ Mean distance between earth and sun	$1.5 \times 10^{11}$ m
✓ Mean distance between earth and moon	$3.8 \times 10^8$ m
✓ Escape Velocity from earth ( $V_{es}$ )	11.2 km/s
✓ Acceleration due to gravity ( $g$ )	$9.8 \text{ m/s}^2$
✓ Speed of light in vacuum ( $c$ )	$3 \times 10^8$ m/s
✓ Solar constant ( $S$ )	$1.34 \text{ W/m}^2$
✓ Universal gravitational constant ( $G$ )	$6.67 \times 10^{-11} \text{ Nm}^2/\text{Kg}^2$
✓ Universal gas constant ( $R$ )	$8.31 \text{ Jmoles}^{-1}\text{K}^{-1}$
✓ Avogadro's number ( $N$ )	$6.023 \times 10^{23} \text{ mole}^{-1}$
✓ Boltzmann's constant ( $k = \frac{R}{N}$ )	$1.38 \times 10^{-23} \text{ J/Kg}$
✓ Stefan's constant ( $\sigma$ )	$5.67 \times 10^{-8} \text{ Wm}^{-2}\text{K}^{-4}$
✓ Plank's constant ( $h$ )	$6.67 \times 10^{-34} \text{ Js}$
✓ Rydberg's constant ( $R$ )	$1.09 \times 10^7 \text{ m}^{-1}$
✓ Triple point of water ( $T_w$ )	273.16 K
✓ Bohr's radius ( $r_B$ )	$5.3 \times 10^{-11} \text{ m}$
✓ Refractive index of air ( $\mu_a$ )	1
✓ Refractive index of water ( $\mu_w$ )	1.33
✓ Refractive index of gas ( $\mu_g$ )	1.5
✓ Charge on electron	$-1.6 \times 10^{-19} \text{ C}$
✓ Charge on proton	$1.6 \times 10^{-19} \text{ C}$
✓ Mass of electron ( $m_e$ )	$9.1 \times 10^{-31} \text{ kg}$
✓ Mass of proton ( $m_p$ )	$1.672 \times 10^{-27} \text{ kg}$
✓ Mass of neutron ( $m_n$ )	$1.674 \times 10^{-27} \text{ kg}$
✓ Speed of sound in air at NTP	332 m/s
✓ Specific heat of water	$1 \text{ cal g}^{-1}\text{C}^{-1} = 4.2 \times 10^3 \text{ J kg}^{-1}\text{K}^{-1}$

## L. Questionnaire

1. The primary source of energy in the earth is – sun
2. Energy is produced in the sun by – nuclear fusion
3. A light year is the unit of – distance
4. The acceleration produced in the body when it falls from top to the ground is –  $9.8\text{m/s}^2$
5. The famous law ‘to every action there is an equal and opposite reaction’ is propounded by – Isaac Newton
6. The artificial satellite completing one revolution in 24 hours is known as – synchronous or geostationary satellite
7. The object should be thrown to space to become a satellite at the speed of –  $8\text{km/sec}$
8. The object must be thrown out of earth to escape earth’s atmosphere at the speed of –  $11.2\text{km/sec}$
9. The force that permits us to walk on ground without falling is – Frictional force
10. The force responsible for the rise of water in plant is – Capillary force
11. The law associated with the rise of balloon in the air is – Archimedes Law
12. The law that explain a needle sinking in water while an iron ship floating on it is – law of flotation
13. A pendulum clock showing correct time, if taken to a place 1 km below sea level it loses – 13.5 second per day.
14. The force responsible for the planet to move around the sun is – gravitational force of attraction between sun and the planets
15. At what temperature the Centigrade and Fahrenheit thermometer have got the same reading –  $(-40^\circ\text{c})$
16. The normal body temperature of human body is –  $37^\circ\text{c}$  ( $98.6^\circ\text{F}$ )
17. The two liquids used mostly in thermometers are – mercury and alcohol
18. The liquid metal used in the thermometers to measure high temperature is – mercury
19. The boiling temperature of mercury is –  $357^\circ\text{c}$
20. The liquid used in thermometer to measure low temperature is – alcohol
21. The freezing point of alcohol is –  $-117^\circ\text{c}$
22. The temperature at which water takes the min volume and max density is –  $4^\circ\text{c}$
23. The temperature at which solid becomes liquid is known as – melting point

24. The temperature at which liquid becomes solid is known as – freezing point
25. Fire alarms works on the basis of principle – Superficial expansion of metals
26. When water freezes into ice its volume – increases.
27. Weight of the petrol is more in – summer than in winter.
28. Refrigerator is based on the theory of – cooling is caused by evaporation
29. The working of pressure cooker is based on increase in boiling point with the increase in – pressure.
30. The relative humidity of the air during rains is – 100%
31. Human being can hear the lowest limit of sound frequency of – 20 Hz (infrasonic)
32. Human being can hear the upper limit of sound frequency of – 20 KHz (ultrasonic)
33. Speed of sound at 0°C is – 330 m/s
34. Sound travels faster in which state of matter – solid
35. The color of the stars when it move away from the earth is – Red
36. The color of stars when it moves towards earth is – violet
37. Light given as a result of heat is known as – incandescent light
38. Part of sunrays that produce sunburn also a source of vitamin D is – ultra violet rays
39. Part of sunrays responsible for producing heat energy – infra red radiation
40. Production of light by living organism is known as – fluorescent
41. Substance emitting light when hit by ultraviolet rays – fluorescent
42. The alloy used in fuses to protect building from excess current – alloy of tin (63%) and lead (37%)
43. The first satellite to be repaired in the space – solar max
44. The principle made use in periscope – total internal reflection
45. The maximum number of syllables a person can speak in a second is – five
46. Albert Einstein won Nobel prize for his work in – law of photoelectric effect
47. The phenomena responsible for twinkling effect of stars – reflection
48. The color that deviates maximum and cannot be seen from far distance – violet
49. The color that has lowest wave length and highest frequency – violet
50. The color that deviates less and can be seen from maximum distance – red
51. The color that has highest wave length and smallest frequency – red
52. The color of rising sun – red
53. The color of setting sun – yellow
54. Which colors are called primary colors? – red, green and blue



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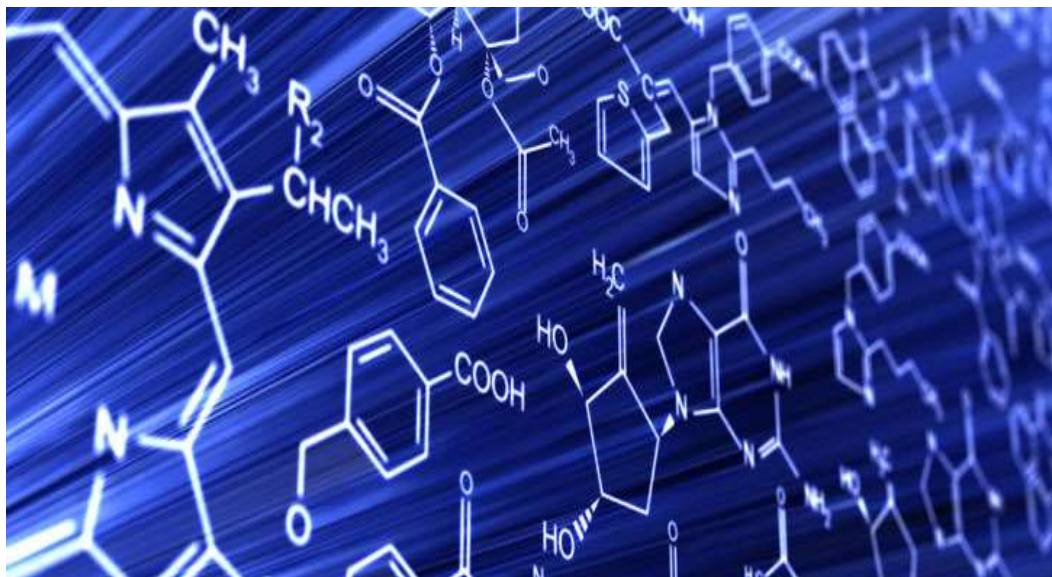
55. Quantum theory was propounded by – Max Planck
56. The part in the refrigerator which controls the temperature level – Thermostat
57. The scientist who discovered the existence of seven colors in sunlight – Isaac Newton
58. Hydrogen Bomb is based on the phenomenon of – Nuclear fusion
59. Explosion of atom bomb is based on the phenomenon of – Nuclear fission
60. The force that enables a body to move in circle is known as – centripetal force
61. The lowest temperature at which the molecular motion in any objects stops – Absolute zero
62. Which state of matter has the greatest potential energy – gas
63. When the temperature of gas is increased its viscosity – increases
64. Sound waves in rocks are – longitudinal and transverse
65. The device used to convert AC to DC is – a diode valve (rectifier)
66. The device used to convert DC to AC is – oscillator
67. The temperature at which the water vapor in the atmosphere is saturated is called – dew point
68. The changing of gas to liquid under high pressure is called – liquefaction
69. A person suffering from myopia is suggested to wear which lens – concave
70. Rocket launched with the escape velocity follows the path – parabolic
71. Diamond shines brightly in air than inside water because of – TIR (total internal reflection takes place in air)
72. Ice skaters use the principle of conservation of – angular momentum
73. The normal intensity of sound in normal conversation is –  $10^{-6}$  W/m<sup>2</sup>
74. Red and blue colors combines to give – magenta
75. For which color the intensity of light is maximum in diamond – red
76. Blue color of sky is due to – scattering of lights (sunrays)
77. The focal length of a convex lens is maximum for – red
78. Kirchhoff's second law is based on the law of conservation of – energy
79. Loudness of a sound depends upon its – amplitude
80. At magnetic poles, the angle of dip is –  $90^\circ$
81. At critical temperature, the surface tension of a liquid is – zero
82. Angular momentum of a body is defined as the product of – moments of inertia and angular velocity
83. The heating element in an electric iron is made of – Nichrome
84. On a day the relative humidity is 100 %, the temperature of the room is – dew point

85. The pressure and the volume are changing but temperature is constant in a process called – isothermal
86. The reciprocal of wavelength is – wave number
87. Transformers are used only in which circuit – AC circuit
88. A certain class of materials with a wide forbidden band between the valance and conduction bands is – insulator
89. If a body is thrown upward, it will go vertically until its vertical velocity becomes 0.
90. When a body is in equilibrium, its acceleration is – zero
91. Lenz's law is a consequence of the law of conservation of – energy
92. The two conductors carrying current in same direction attract each other due to the existence of – magnetic force
93. Transformer is a device used to transform – AC voltage
94. What type of mirror is used in torch and headlight of vehicles – parabolic mirrors
95. The focal length of a plane mirror is – infinity
96. The field of vision is maximum for which mirror – convex
97. Which mirror is used in shaving and in cinema projectors – concave
98. The color of light determines its – wavelength
99. The color of light is determined by its – frequency
100. Twinkling of stars is due to – refractive index fluctuation of atmosphere
101. A stick partially dipped in water seems bent due to – refraction
102. Air bubble in a jar of water shine due to – total internal reflection
103. Rainbow is formed due to combination of – dispersion and TIR
104. Who discovered X-rays – Roentgen
105. The frequency of X-ray ranges from –  $10^6\text{Hz}$  to  $10^{19}\text{Hz}$
106. The voltage applied across an X-ray tube is – 10 KV
107. Hydrogen atom doesn't emit X-ray because – its energy levels are too close.
108. Hard and soft X-rays depends on – wavelength
109. The total energy of an electron in an atom is always – negative
110. Bohr's postulates correctly measures – angular momentum
111. The heaviest stable nucleus is – lead
112. Who discovered the nucleus – Rutherford [proton was discovered by Goldstein and neutron by Chadwick]
113. The best moderator is – heavy water
114. What is the thickness of the depletion layer –  $10^{-6}$  m

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115. When does the semiconductor behave as perfect insulators – at absolute temperature
116. In a good conductor energy gap between the conduction band and valance band is – zero
117. The temperature of sun is measured by – radiation pyrometer
118. The most common stars like the sun are – dwarfs
119. What is the velocity of sound for air – 330 m/s (1450 m/s for water)
120. What is the frequency range of audible sound – 20 Hz to 20,000 Hz
121. The waves used to determine the depth of sea – ultrasonic
122. Velocity of wave in a string depends upon – tension in string
123. The sweetness of sound on its – periodicity & regularity
124. The maximum tolerable sound intensity is 120 dB
125. The loudness of sound depends upon – amplitude
126. The pitch (sharpness) of sound depends upon – frequency
127. Quality of sound depends upon – overtones
128. Which one is more elastic glass or rubber – glass
129. Clouds float in the sky due to their – low density
130. Rain drops fall with constant velocity due to – viscosity
131. Viscosity of liquids is due to the force – cohesive
132. Which scale has no negative temperature – Kelvin
133. A device to detect heat radiation – bolometer
134. The law to determine the temperature of a star – Wien's Law [Stefan's Law]
135. The deviation produced by a prism is maximum for – indigo
136.  $F = 6\pi\eta rv$  is the expression of which law – Stokes Law
137. Which planet is known as the Earth's twin – Venus
138. The first and last seen comets from the earth surface are – Temple Tuttle and Shoemaker Levy
139. The time taken by sun to complete one rotation around the galactic centre is known as – cosmic year
140. The constellation (small groups of stars with fixed shape) visible with naked eyes is – Ursa Major
141. Name the largest asteroid – Ceres
142. The red planet is – Mars
143. The hottest and brightest planet is – Venus (Morning and Evening Star)
144. The electric equipment which allows only the permutable current to pass through the circuit is called – MCB (Miniature Circuit Breaker)
145. The phenomenon of acquiring temporary electrification under the influence of a charged body is called – electrical induction

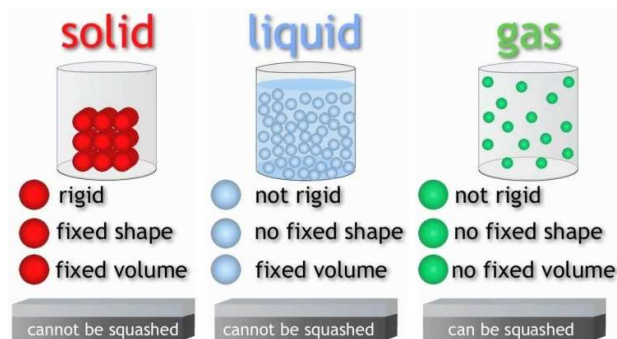
## Chemistry



Chemistry is defined as the branch of science, which deals with the study of composition, structure and properties of matter. It also studies the chemical processes of matter. In fact, the whole universe is made up of only two things viz. matter and energy. Chemistry is divided into several branches such as physical chemistry, organic chemistry, inorganic chemistry and analytical chemistry. Physical chemistry deals with the physical properties of chemical substances. Organic chemistry is the study of carbon and its compounds, formed especially with hydrogen, oxygen and nitrogen. About 3 million compounds have been identified and named so far. Inorganic chemistry studies the properties and reactions of inorganic compounds. And analytical chemistry is concerned with the qualitative and quantitative analysis of different substances.

## A. States of Matter

Matter is anything which occupies space, possess mass and can be judged by one or more of the five senses. Matter can exist in different states. Solids, liquids, and gases are three common states of matter. Solids have fixed shape and volume. Rocks and woods are solids. Liquids have indefinite shape, usually determined by the containers they fill. Water and milk are the examples of liquids. Gases have no shape. Examples of gases are oxygen and nitrogen gas.



### Solids

Solid is the densest state of matter. Solids can be made of elements or compounds. They can also be made of mixtures, or combinations of different elements and compounds. Most rocks are mixture of many elements and compounds. The molecules of solids are very tightly bound and packed into regular shapes. There is a very little free space between the molecules and they cannot move. This gives solids their fixed shape and volume. Solids are divided into two classes; amorphous and crystals.

- i. **Amorphous:** Amorphous solids are substances whose constituents (atoms, molecules, or ions) are not orderly arranged in the three dimensional pattern. Calcium Carbonate powder, soda ash, glass, rubber and plastics are the examples of amorphous solids. These are isotropic in nature, regarded as ‘super cooled liquid’ or ‘liquids at all temperature’.
- ii. **Crystals:** Crystals are solids that have organized structures. The molecules in a gas or liquid bounce or flow around each other freely. When a liquid changes into a solid state, the molecules lock together. The molecules link one to another in a uniform pattern that is repeated over and over. This results in the formations of a crystal. Crystals often appear as strange and beautiful geometric shapes. It has a sharp melting point and is anisotropic in nature. Quartz, diamonds, graphite, and ruby are the common examples of crystals. Quartz always grows in the shape of six- sided columns.

**Isotropy and Anisotropy:** The substances whose physical properties like electrical conductivity, refractive index, thermal conductivity, thermal expansion, etc are same in all direction are called isotropic substances and the phenomenon is called isotropy. The substances whose physical properties are not identical in all directions are called anisotropic substances and the phenomenon is called anisotropy.

### Liquids

Liquids are less dense than solids. The molecules of a liquid are not held together as strongly as in a solid. They can move around each other. This enables the liquids to flow. Liquids take the shape of the container they are held in unlike solids which keep their own shape. The molecules of a liquid often have a greater attraction for other substances than they have for each other. Therefore, they rise in narrow tubes above their own level. This action is called capillarity or capillary action. Plants draw water from the roots by capillary action.

**Solution:** It is a homogenous mixture. The dispersed phase is solute and medium phase is solvent which is in large amount. A solution having maximum amount of solute that can be dissolved at given temperature is called saturated solution. A solution having less solute than saturated solution at given temperature is called unsaturated solution. A solution having more solute than saturated solution at given temperature is called super saturated solution.

### Gases

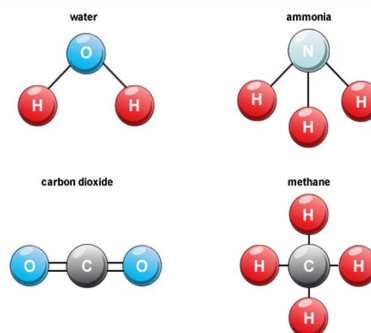
Gases are least dense state of matter. In a gas, the molecules can move around freely, allowing gas to spread. Gases are thinner and lighter than solids and liquids. They have no shape of their own. They take the shape of the container. A gas has no fixed shape or fixed volume.

### Changing States

Increasing temperature or increasing pressure and freezing something or decreasing pressure often changes the state of matter. As the temperature rises, matter moves to a more active state. When the temperature of a solid rises, it melts and changes into the liquid state. When the temperature of a liquid rises, it boils and changes into the gaseous state. When the temperature of a liquid is lowered, it freezes and changes into its solid state.

## B. Atoms and Molecules

An atom is the smallest particle of an element which can take part in chemical reaction and ionizes in water to produce  $H^+$  ion. All atoms have a nucleus around which negatively charged electrons orbit. The nucleus of an atom contains protons and neutrons. Protons are positively charged while neutrons are under charged or electrically neutral particles.



**Different kinds of Atoms:** There are more than 109 different types of atoms, one for each element. Everything around us is made up of different combinations of these atoms. All these different kind of atoms differ from each other in the numbers of protons, neutrons, and electrons. They also differ in size, mass, and other properties.

### Atomic Particles

**Electron:** It was discovered as a result of study of cathode rays by JJ Thomson. It is a negatively charged particle carrying one unit negative charge i.e,  $-1.6 \times 10^{-19}c$  and has mass  $9.1 \times 10^{-31}kg$ . The name electron was given by Stoney. Electrons are common universal constituent of all atoms. Mass of one mole of electron is 0.55mg.

**Proton:** It was discovered by E. Goldstein as result of anode rays. It is positively charged particle carrying one unit positive charge i.e,  $+1.6 \times 10^{-19}c$  and mass of  $1.672 \times 10^{-27}kg$ . The name proton was given by Rutherford. Proton is also called as canal rays.

**Neutron:** It is the neutral particle discovered by Chadwick as a result of collision of Be with  $\alpha$ -particles. It has a mass of  $1.675 \times 10^{-27}Kg$  which is slightly heavier to that of H-atom or Proton.

**Radicals:** Radicals are the atoms or groups of atoms that carry positive or negative charge and behave as a single unit during a chemical reaction.

### Molecules

The smallest unit of an element or a compound that is capable of stable existence called molecules. Molecules are one of the basic units of matter. They are made up of atoms that are held together in certain arrangements called bonds. A molecule is the smallest

piece of a matter that any substance can be divided into and yet retain all the characteristics of the original substance.

### **Different types of Molecules**

A molecule that contains two atoms, such as nitric oxide (NO), is called a diatomic molecule. A molecule made up of three atoms, such as water (H<sub>2</sub>O) and carbon dioxide (CO<sub>2</sub>), is called a triatomic molecule. A large molecule, such as DNA can contain millions of atoms.

**Ions:** Ions are positively or negatively charged atoms. A normal atom is called a neutral atom. Ions have either extra electrons or missing electrons. Ions with extra electrons are negatively charged. They are called anions. Ions with missing electrons are positively charged. They are called cations.

**Isotopes:** Isotopes are the different forms of the same element. The atoms of isotopes have the same number of protons, but they differ in the number of neutrons. For example, the isotopes of oxygen are oxygen-16, oxygen-17, and oxygen-18, where the number refers to the number of protons and neutrons in the nucleus.

**Radioactivity:** Radioactivity is the constant emission of radiation from an atom. It is the process in which an unstable atomic nucleus loses energy by emitting radiation in the form of particles or electromagnetic waves. Radioactive atoms are unstable.

### **Molecular Formula**

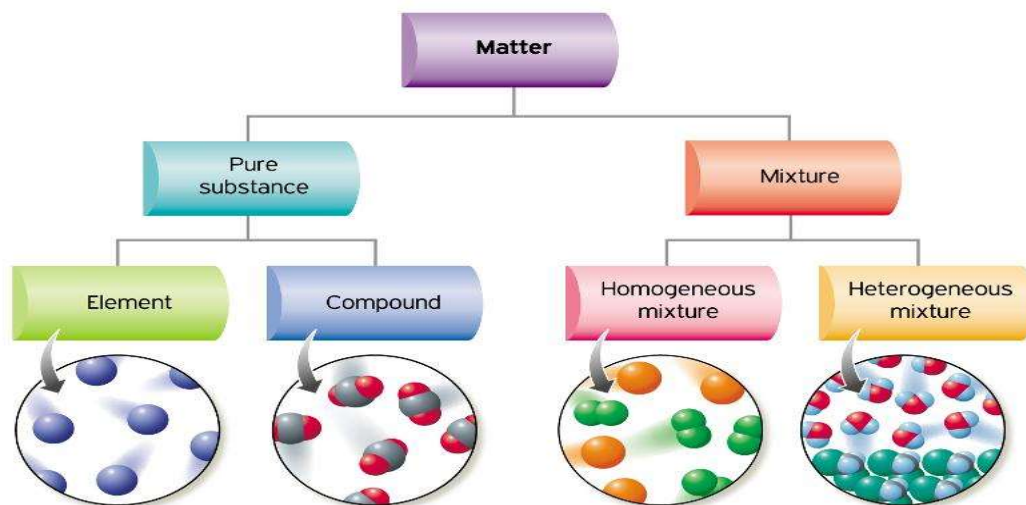
It is a symbolic representation of a molecule of an element or a compound that shows the actual number of atoms present in the molecules. For example; sodium chloride – NaCl (where, Na is a symbol for sodium and Cl for chlorine), calcium carbonate – CaCO<sub>3</sub>, etc.

The molecular formula of a compound shows the actual number of various atoms of different elements present in one molecules of compound, which is the actual formula of a compound.



## C. Elements and Compounds

Elements are the purest matter made up of only one kind of atom and can neither be decomposed nor built from simpler substances by any means. A sample of an element contains only one kind of atom. For example a lump of silver contains only silver atoms.



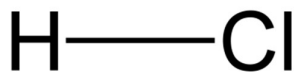
### Element

An element is a pure substance made up of only one type of atom. The first 92 elements in the periodic table from hydrogen (H) to uranium (U) occur naturally. The atoms of an element always have the same atomic number. For example, cobalt is an atom having atomic number 27.

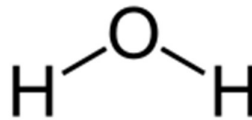
**Element Symbols:** Elements are known by common names as well as by their abbreviations. These abbreviations consist of one or two letters. These abbreviations are called element symbols. They are mostly derived from English, Latin, or German words. The symbols of some common elements are:

Carbon	C
Iron	Fe
Copper	Cu
Chlorine	Cl

**Valency:** It is defined as the number of electrons lost, gained or shared with one atom of the element in order to acquire the stable electronic configuration of the nearest inert gas element.



(Valency of Cl is 1)



(Valency of O is 2)

### The Heaviest Elements

**Osmium:** Osmium is the heaviest element of all. It was discovered by the British chemist Smithson Tennant in 1803. He named it after the Greek word for smell because it smelt bad. Osmium is twice as heavy as lead. Osmium is also very hard, and is used to make hard-wearing points, such as the nibs of fountain pens.

**Platinum:** Platinum was used before anyone realized that it was an element. It weighs almost as much as osmium (21.45g per cubic centimeter) and is used to make jewellery that is even more expensive than gold. It is also used in catalytic converters in cars to reduce the pollution from exhaust gases.

**Plutonium:** Plutonium was discovered in 1941 and is a heavy and highly radioactive metal. It is used as a nuclear fuel and in nuclear weapons- a kilogram of plutonium produces an explosion equivalent to 20000 tons of TNT.

**Gold:** Gold is the best known of all heavy metals-though at 19.29g per cubic centimeter it is less heavy than the others here. Gold has been prized since ancient times and has many uses beyond coins and jewellery.

### The Lightest Elements

**Hydrogen:** Hydrogen is the simplest and lightest element, and the most common in the entire Universe-93 percent of all atoms in the universe are hydrogen atoms. On earth, it is relatively rare in the atmosphere-only 5 of every million litres of air are hydrogen but hydrogen combined with oxygen forms all the water in the world's oceans, lakes and rivers. Hydrogen is very light. It was used in balloons carrying human passengers. Today, hydrogen fuel cells are used to power clean energy cars.

**Helium:** Helium is twice as heavy as hydrogen, but it is still only one seventh the weight of air. Unlike hydrogen, helium does not burn, so it is used in modern airships.

**Lithium:** Lithium was discovered in 1817 by Swedish scientist Johan August Arfvedson. It takes its name from the Latin word for rock, although it is actually a metal. Lithium is so light (42 times lighter than the heaviest element, Osmium) and so soft that it can be easily cut with a knife. It floats because it is half as dense as water and lighter than some types of wood. It is used to make lithium batteries.

**Potassium and Sodium:** Both were discovered in 1807 by Sir Humphry Davy. Both are metals that are lighter than water. In a laboratory, potassium is usually kept in paraffin because if it comes into contact with water it releases hydrogen and generates so much heat that it catches fire. Sodium also has to be kept immersed in paraffin if it is dropped into water it hurtles around on the surface before noisily bursting into flames. Potassium is vital for plant growth and human well being – our body contains about 140 gm of it. Sodium is relatively common as part of a compound in combination with chlorine it is ordinary table salt.

### Highest Melting Points

Element	Melting Point (°C)
1. Carbon	3527
2. Tungsten	3422
3. Rhenium	3186
4. Osmium	3033
5. Tantalum	3017

### Compound

A compound is a pure substance that is formed by the chemical combination of at least two different elements in a definite proportion by weight. A compound can be split into two or more elements by chemical processes. A compound will contain more than one kind of atoms. It is generally represented by a formula. For example, the formulae of some important compound are:

Sodium chloride	NaCl
Methane	CH <sub>4</sub>
Glucose	C <sub>6</sub> H <sub>12</sub> O <sub>6</sub>

Compounds have a fixed composition. The properties of a compound may differ from the elements it is formed from. The elements in a compound cannot be easily separated.

**Empirical Formula:** The simplest chemical formula of a compound in which the constituent atoms of various elements are present in the simplest whole number ratio. For example; the empirical formula of glucose is CH<sub>2</sub>O whereas, the molecular formula of glucose is C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>.

### Mixture

A mixture is made up of at least two elements or compounds. Mixtures are formed by mixing substances together physically and not chemically. The substances in a mixture

retain their own properties. Mixtures can be easily separated by physical means such as filtration. Air, soil, and solutions are some examples of mixtures. Mixtures can be categorized as homogeneous or heterogeneous. Homogeneous mixtures are very well mixed. Solutions are homogeneous mixtures. Heterogeneous mixtures do not appear to be the same throughout. Concrete and sand found in beaches are heterogeneous mixtures.

### The Periodic Table

The periodic table is a tabular method of displaying chemical elements. Its invention in 1869 was generally credited to Russian chemist, Dmitri Mendeleev. Mendeleev's periodic table lists the elements according to the increasing order of their atomic weights. The atomic weight is the average of the atomic masses of all the isotopes of the element. The atomic mass is the mass of an atom at rest. The modern periodic table lists the elements according to the increasing order of their atomic numbers. The atomic number is the number of protons found in the nucleus of an atom. The current standard table contains 118 confirmed elements.

**Dmitri Lvanovich Mendeleev (1834 - 1907):** Dmitri Lvanovich Mendeleev was a Russian chemist. He created the first version of the periodic table of elements according to the increasing order of their atomic weights and the physical and chemical properties of elements are the periodic function of their atomic weight. Mendeleev's table had many empty spaces. Mendeleev predicted that new elements would be discovered to fulfill the blank spaces. He even predicated the properties of the undiscovered elements based on their positions in the periodic table.

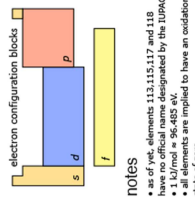
**John Alexander Reina Newlands (1837 - 1898):** John Alexander Reina Newlands was an English analytical chemist. He prepared the periodic table in 1863. The elements were arranged in order of their relative atomic masses. Newlands' table followed the 'Law of Octaves' according to which every eighth elements has similar properties.

**Modern (Bohr's or Moseley's) Periodic Table:** It was given by Moseley where, the physical and chemical properties of elements are the periodic functions of their atomic number. It has seven horizontal series called periods and 18 vertical columns called groups. The first period is the shortest which has only two elements and sixth is the longest period containing 32 elements. The 18 vertical column called group are devoted by I-A to VII-B, VIII and O group.

## The Periodic Table of the Elements

By Andrew Cooke, version 3.3

group 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18																																																																			
period 1	1 H 1.00794 [1s] <sup>1</sup>	2 He 4.002602 [1s] <sup>2</sup>																																																																																		
period 2	3 Li 6.941 [He] 2s <sup>1</sup>	4 Be 9.012182 [He] 2s <sup>2</sup>	5 B 10.811 [He] 2s <sup>2</sup> 2p <sup>1</sup>	6 C 12.0107 [He] 2s <sup>2</sup> 2p <sup>2</sup>	7 N 14.00642 [He] 2s <sup>2</sup> 2p <sup>3</sup>	8 O 15.9994 [He] 2s <sup>2</sup> 2p <sup>4</sup>	9 F 18.998403 [He] 2s <sup>2</sup> 2p <sup>5</sup>	10 Ne 20.1797 [He] 2s <sup>2</sup> 2p <sup>6</sup>										11 Na 22.989769 [Ne] 3s <sup>1</sup>	12 Mg 24.3050 [Ne] 3s <sup>2</sup>	13 Al 26.981538 [Ne] 3s <sup>2</sup> 3p <sup>1</sup>	14 Si 28.0855 [Ne] 3s <sup>2</sup> 3p <sup>2</sup>	15 P 30.973762 [Ne] 3s <sup>2</sup> 3p <sup>3</sup>	16 S 32.065 [Ne] 3s <sup>2</sup> 3p <sup>4</sup>	17 Cl 35.453 [Ne] 3s <sup>2</sup> 3p <sup>5</sup>	18 Ar 39.948 [Ne] 3s <sup>2</sup> 3p <sup>6</sup>																																																											
period 3	19 K 39.0983 [Ar] 4s <sup>1</sup>	20 Ca 40.078 [Ar] 4s <sup>2</sup>	21 Sc 44.955912 [Ar] 3d <sup>1</sup> 4s <sup>2</sup>	22 Ti 47.887 [Ar] 3d <sup>2</sup> 4s <sup>2</sup>	23 V 50.9415 [Ar] 3d <sup>3</sup> 4s <sup>2</sup>	24 Cr 51.9962 [Ar] 3d <sup>5</sup> 4s <sup>1</sup>	25 Mn 54.938044 [Ar] 3d <sup>5</sup> 4s <sup>2</sup>	26 Fe 55.845 [Ar] 3d <sup>6</sup> 4s <sup>2</sup>	27 Co 58.933194 [Ar] 3d <sup>7</sup> 4s <sup>2</sup>	28 Ni 58.6934 [Ar] 3d <sup>8</sup> 4s <sup>2</sup>	29 Cu 63.546 [Ar] 3d <sup>10</sup> 4s <sup>1</sup>	30 Zn 65.38 [Ar] 3d <sup>10</sup> 4s <sup>2</sup>	31 Ga 69.723 [Ar] 3d <sup>10</sup> 4s <sup>1</sup> 4p <sup>1</sup>	32 Ge 72.64 [Ar] 3d <sup>10</sup> 4s <sup>2</sup> 4p <sup>2</sup>	33 As 74.92160 [Ar] 3d <sup>10</sup> 4s <sup>2</sup> 4p <sup>3</sup>	34 Se 78.96 [Ar] 3d <sup>10</sup> 4s <sup>2</sup> 4p <sup>4</sup>	35 Br 79.904 [Ar] 3d <sup>10</sup> 4s <sup>2</sup> 4p <sup>5</sup>	36 Kr 83.796 [Ar] 3d <sup>10</sup> 4s <sup>2</sup> 4p <sup>6</sup>																																																																		
period 4	37 Rb 85.4678 [Kr] 4d <sup>1</sup> 5s <sup>1</sup>	38 Sr 87.62 [Kr] 5s <sup>2</sup>	39 Y 88.90585 [Kr] 4d <sup>1</sup> 5s <sup>2</sup>	40 Zr 91.224 [Kr] 4d <sup>2</sup> 5s <sup>2</sup>	41 Nb 92.90638 [Kr] 4d <sup>4</sup> 5s <sup>1</sup>	42 Mo 95.96 [Kr] 4d <sup>5</sup> 5s <sup>1</sup>	43 Tc 98 [Kr] 4d <sup>5</sup> 5s <sup>2</sup>	44 Ru 101.07 [Kr] 4d <sup>7</sup> 5s <sup>1</sup>	45 Rh 102.9055 [Kr] 4d <sup>8</sup> 5s <sup>1</sup>	46 Pd 106.42 [Kr] 4d <sup>10</sup>	47 Ag 107.8682 [Kr] 4d <sup>10</sup> 5s <sup>1</sup>	48 Cd 112.411 [Kr] 4d <sup>10</sup> 5s <sup>2</sup>	49 In 114.818 [Kr] 4d <sup>10</sup> 5s <sup>1</sup> 5p <sup>1</sup>	50 Sn 118.710 [Kr] 4d <sup>10</sup> 5s <sup>2</sup> 5p <sup>2</sup>	51 Sb 121.760 [Kr] 4d <sup>10</sup> 5s <sup>2</sup> 5p <sup>3</sup>	52 Te 127.60 [Kr] 4d <sup>10</sup> 5s <sup>2</sup> 5p <sup>4</sup>	53 I 126.90447 [Kr] 4d <sup>10</sup> 5s <sup>2</sup> 5p <sup>5</sup>	54 Xe 131.293 [Kr] 4d <sup>10</sup> 5s <sup>2</sup> 5p <sup>6</sup>																																																																		
period 5	55 Cs 132.90545 [Xe] 4f <sup>14</sup> 5d <sup>1</sup> 6s <sup>1</sup>	56 Ba 137.327 [Xe] 4f <sup>14</sup> 6s <sup>2</sup>	57 La 138.90547 [Xe] 4f <sup>1</sup> 5d <sup>1</sup> 6s <sup>2</sup>	58 Ce 140.12 [Xe] 4f <sup>1</sup> 5d <sup>1</sup> 6s <sup>2</sup>	59 Pr 140.90766 [Xe] 4f <sup>3</sup> 6s <sup>2</sup>	60 Nd 144.242 [Xe] 4f <sup>4</sup> 6s <sup>2</sup>	61 Pm [145] [Xe] 4f <sup>5</sup> 6s <sup>2</sup>	62 Sm 150.36 [Xe] 4f <sup>6</sup> 6s <sup>2</sup>	63 Eu 151.964 [Xe] 4f <sup>7</sup> 6s <sup>2</sup>	64 Gd 157.25 [Xe] 4f <sup>7</sup> 5d <sup>1</sup> 6s <sup>2</sup>	65 Tb 158.92535 [Xe] 4f <sup>9</sup> 6s <sup>2</sup>	66 Dy 162.5003 [Xe] 4f <sup>10</sup> 6s <sup>2</sup>	67 Ho 164.93033 [Xe] 4f <sup>11</sup> 6s <sup>2</sup>	68 Er 167.259 [Xe] 4f <sup>12</sup> 6s <sup>2</sup>	69 Tm 168.9342 [Xe] 4f <sup>13</sup> 6s <sup>2</sup>	70 Yb 173.054 [Xe] 4f <sup>14</sup> 6s <sup>2</sup>																																																																				
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<sup>14</sup> 7s <sup>2</sup>	167 Uuq [295] [Og] 5f <sup>14</sup> 6d <sup>1</sup> 7s <sup>2</sup>	168 Uuq [295] [Og] 5f <sup>14</sup> 7s <sup>2</sup>	169 Uuq [295] [Og] 5f <sup>14</sup> 6d <sup>1</sup> 7s <sup>2</sup>	170 Uuq [295] [Og] 5f <sup>14</sup> 7s <sup>2</sup>	171 Uuq [295] [Og] 5f <sup>14</sup> 6d <sup>1</sup> 7s <sup>2</sup>	172 Uuq [295] [Og] 5f <sup>14</sup> 7s <sup>2</sup>	173 Uuq [295] [Og] 5f <sup>14</sup> 6d <sup>1</sup> 7s <sup>2</sup>	174 Uuq [295] [Og] 5f <sup>14</sup> 7s <sup>2</sup>	175 Uuq [295] [Og] 5f <sup>14</sup> 6d <sup>1</sup> 7s <sup>2</sup>	176 Uuq [295] [Og] 5f <sup>14</sup> 7s <sup>2</sup>	177 Uuq [295] [Og] 5f <sup>14</sup> 6d <sup>1</sup> 7s <sup>2</sup>	178 Uuq [295] [Og] 5f <sup>14</sup> 7s <sup>2</sup>	179 Uuq [295] [Og] 5f <sup>14</sup> 6d <sup>1</sup> 7s <sup>2</sup>	180 Uuq [295] [Og] 5f <sup>14</sup> 7s <sup>2</sup>	181 Uuq [295] [Og] 5f <sup>14</sup> 6d <sup>1</sup> 7s <sup>2</sup>	182 Uuq [295] [Og] 5f <sup>14</sup> 7s <sup>2</sup>	183 Uuq 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<sup>1</sup> 7s <sup>2</sup>	200 Uuq [295] [Og] 5f <sup>14</sup> 7s <sup>2</sup>



notes

- s and p orbitals are 1.13, 1.15, 1.17 and 1.18 times the radius of the orbitals assigned by the Bohr model.
- 1.13/mol = 56.485 eV.
- all elements are implied to have an oxidation state of zero.

## D. Metals and Metallurgy

Only 90 elements occur in nature and scientists have prepared more than dozen of elements in lab. The number of elements known to us now reaches to about 118. Among them some are metals and others are non-metals. Metals are those substances, the atom of which can easily lose electron to form a positive ion. These are elements that are opaque, lustrous and good conductors of heat and electricity. Iron, gold and silver are common metals.

Non-metals are the elements which forms negative ion by gaining electrons. These are the elements that cannot conduct electricity or heat very well. Examples of non-metals are oxygen, hydrogen and carbon. Only elements in periodic table are generally considered non-metals while these are over 80 metals.

### Properties of metals:

- ✓ Metals have luster. They are shiny when cut, scratched, or polished.
- ✓ They are malleable, that is, they can be hammered into thin sheets without breaking.
- ✓ They are good conductor of heat and electricity.
- ✓ They are ductile, that is, they can be melted and drawn into thin wires.
- ✓ All metals except mercury are solid at room temperature.
- ✓ Most metals have high melting points.

### Properties of non-metals:

- ✓ Non-metals have no luster, that is, they have a dull appearance.
- ✓ They are poor conductor of heat and electricity.
- ✓ They are brittle, that is, they break easily.
- ✓ They are neither ductile nor malleable.
- ✓ They have low density and low melting points.

**Noble Metals:** Noble metals are pure metals. They are non reactive and do not combine with each other elements to form compounds. They do not corrode easily. Noble metals include copper, palladium, silver, platinum, and gold. They are ideal for jewellery and coins.

**Alkali Metals:** Alkali metals are very reactive. They have low melting points. They are soft enough to be cut with a knife. Potassium and sodium are two examples of alkali metals.

**Alkaline Earth Metal:** Alkaline earth metals are found in compounds with many different minerals. They are less reactive than alkali metals. They are harder and have higher melting points. Calcium, magnesium, and barium are common examples of alkaline earth metals.

**Amalgams:** They are the alloys with mercury. Example; sodium amalgam, zinc amalgam, etc. Copper amalgam is used in filling of teeth.

### **Metalloids**

Those elements which show the properties of both metals and non-metals are called metalloids. For example, carbon, silicon, arsenic, antimony, etc. Metalloids possess metallic luster like metals and they form acidic oxides like non-metals. So, these elements are called metalloids or semi-metals.

### **Alloys**

An alloy is a substance composed of two or more metals. Some metals are mixed with less valuable metals to enhance their qualities. Metals such as silver are weak and soft in their original form. They are mixed with other metals to make them hard and strong. Alloys can be classified by the number of their constituents. An alloy with two components is called a binary alloy, while alloys with three components are called ternary alloys and so forth. Some common alloys are brass, cupronickel, stainless steel and duralumin. Bronze is a dense and heavy alloy of copper and tin. It is a very useful alloy.

#### **Some Important Alloys and Contents**

<b>Name of the Alloy</b>	<b>Composition</b>
1. Brass	Copper + Zinc
2. Bell metals	Copper + Tin
3. Bronze	Copper + Tin
4. Dental gold	Gold + Copper + Silver
5. Dentists amalgam	Mercury + Copper
6. Duralumin	Aluminium + Copper + Magnesium + Manganese
7. German silver	Copper + Zinc + Nickel
8. Gun metal	Copper + Zinc + Tin
9. Invar	Iron + Nickel + Carbon
10. Nichrome	Nickel + Chromium + Iron
11. Noble metal	Nickel + Copper + Iron
12. Stainless steel	Iron + Nickel + Chromium
13. Steel	Iron + Carbon
14. Tungsten steel	Iron + Carbon + Tungsten
15. Sterling silver	Silver + Copper

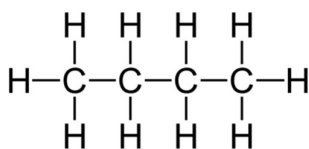
## E. Hydrocarbons

The compounds which are made up of only carbon & hydrogen elements are called hydrocarbons. These are considered to be the parent organic compound since other organic compounds are supposed to be derived from them by the replacement of one or more hydrogen atoms by other atoms or groups of atoms.

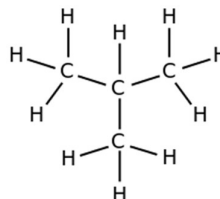
### Classification of hydrocarbons:

On the basis of structure, hydrocarbons can be classified into two main classes.

- 1. Open chain hydrocarbon:** Hydrocarbons which contain carbon atom linked in an open chain known as open chain hydrocarbon. It may be straight or branched.



n-butane (straight chain)



isobutane (branched chain)

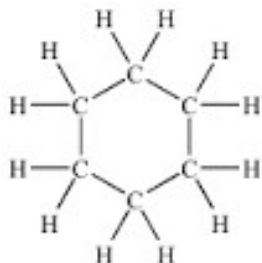
These compounds are also referred to as acyclic or aliphatic compounds. They are further divided into (i) Alkanes (ii) Alkenes & (iii) Alkynes

Alkanes	Alkenes	Alkynes
Alkanes are the saturated hydrocarbons.	Alkenes are unsaturated hydrocarbon	Alkynes are unsaturated hydrocarbon
They contain only carbon-carbon and carbon-hydrogen single bonds in their molecules.	They contain at least one carbon-carbon double bond in their molecules.	They contains at least one carbon-carbon double bond in their molecules
They are also called <b>paraffins.</b>	They are also called <b>olefins.</b>	They are also called <b>actylenes.</b>
General formula: $C_nH_{2n+2}$	General formula: $C_nH_{2n}$	General formula: $C_nH_{2n-2}$

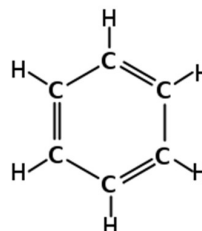
- 2. Closed chain or cyclic hydrocarbon:** They contain one or more rings of carbon atom. It is further divided into two categories:
  - i. Alicyclic hydrocarbons:** They contain ring or closed chain of carbon atom but they resemble open chain hydrocarbon in many aspects. E.g. Cycloalkanes, Cycloalkenes, Cycloalkynes, etc



- ii. Aromatic hydrocarbons: These hydrocarbons are called arenes. They contain one or more hexagonal carbocyclic ring. E.g. Benzene.



Cyclohexane (Alicyclic)



Benzene (Aromatic)

### Functional Group

It is defined as an atom or group of atoms which largely determines the chemical properties of the organic compounds. The properties of the organic compounds are controlled largely by the functional group.

\*R: Alkyl group

Functional Group	Name
-X (-Cl, -Br, -I)	Halide
-OH	Alcohol
-CHO	Aldehyde
-COOH	Carboxy
RC(=O)R'	Ketone
-NH <sub>2</sub>	Amide
-CN or -C≡N	Cyanide
-NC	Isocyanide
-OR*	Alkoxy(ester)
(RC(O)) <sub>2</sub> O	Acid anhydride
-CNO or -C≡N→O	Cyanate
-NCO or -N=C=O	Isocyanate

### Homologous Series:

A homologous series can be defined as a group of compounds in which various members have similar chemical properties but different physical properties and differ in composition from one another by -CH<sub>2</sub> or 14 molecular weight and possess same functional group. The individual members of homologous series are known as homologous. Example:

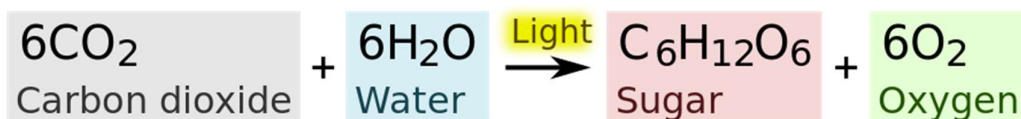
- Alkane (C<sub>n</sub>H<sub>2n+2</sub>): CH<sub>4</sub>, C<sub>2</sub>H<sub>6</sub>, C<sub>3</sub>H<sub>8</sub>, C<sub>4</sub>H<sub>10</sub>, ... etc.
- Alkene (C<sub>n</sub>H<sub>2n</sub>): CH<sub>2</sub>, C<sub>2</sub>H<sub>4</sub>, C<sub>3</sub>H<sub>6</sub>, ... etc.
- Alcohol (C<sub>n</sub>H<sub>2n+1</sub>OH): CH<sub>3</sub>OH, C<sub>2</sub>H<sub>5</sub>OH, C<sub>3</sub>H<sub>7</sub>OH, ... etc

## F. Biomolecules (Molecules in life)

All the living things are basically composed of several complex inorganic substances like carbohydrates, proteins, nucleic acid, lipids etc. which play specific functions in running their life processes. These molecules are biomolecules.

### Carbohydrates

Carbohydrates are the compounds that contain carbon contained with hydrogen and oxygen. They are the hydrates of carbon so called carbohydrates. They are formed in plants by the process of photosynthesis.



They are polyhydroxy aldehydes or ketones or any other substances that can yield these substances on hydrolysis.

#### Classification of Carbohydrates:

On the basis of hydrolysis:

- i. Monosaccharides: They are the simplest carbohydrates that cannot be broken into smaller units on hydrolysis. They contain one carbonyl group and two or more hydroxyl groups. E.g. Ribose, glucose, fructose.
- ii. Oligosaccharides: They are those which can give two to ten monosaccharides on hydrolysis. E.g. Sucrose, maltose, lactose etc.
- iii. Polysaccharides: They are those which can yield more than ten monosaccharides on hydrolysis. E.g. Cellulose, glycogen, starch etc.

On the basis of solubility:

- i. Sugar: They are crystalline water soluble and sweet in taste. E.g. Glucose, fructose, sucrose etc.
- ii. Non-sugar: They are amorphous, water insoluble and tasteless. E.g. Starch, cellulose etc.

### Amino Acids and Proteins

Amino acids are the amino substituted acids containing both amino ( $-\text{NH}_2$ ) and carboxyl ( $-\text{COOH}$ ) groups. Amino acids are the building blocks of proteins. Proteins are the long chain polymers of amino acids. Protein is the complex nitrogenous organic compound found in protoplasm. The amino acids are held together by peptide bond. There are 20 amino acid required for the protein synthesis that are grouped in two classes:

- i. **Essential amino acid:** They cannot be synthesized by the body and therefore need to be supplied through the diet. Lack of these amino acids can cause various diseases. These amino acids are 10 in number.
- ii. **Non-essential amino acid:** They can be synthesized by our body and therefore need not to be consumed in the diet. They are also 10 in number.

**Classification of Proteins:** On the basis of functional properties;

- i. Defense Proteins: Immunoglobulins involved in defense mechanism
- ii. Contractile Proteins: Proteins of skeleton muscles involved in muscle contraction and relaxation
- iii. Respiratory Proteins: Involved in the function of respiration like; hemoglobin, myoglobin, cytochromes
- iv. Structural Proteins: Proteins of skin, cartilage, nail
- v. Enzymes: Proteins acting as enzymes
- vi. Hormones: Proteins acting as hormones

### Nucleic Acids

They are the water soluble high polymers present in the nuclei of all living cells. All nucleic acid is composed of three components; a pentose sugar, a nitrogen base and a phosphate group. The bases present in nucleic acid are of two types:

- a. Purine base: Adenine(A) and Guanine(G)
- b. Pyrimidine base: Uracil(U), Thymine(T) and Cytosine(C)

**Nucleoside:** Sugar + base segments. **Nucleotide:** Sugar + base + phosphate segments. Nucleic acid is the polymers of these nucleotide monomers. Nucleic acids are of two types; if the nucleotide contains ribose sugar it is called **ribonucleotide** and if it contains deoxyribose sugar it is called **deoxyribonucleotide**.

### Difference between DNA and RNA

DNA	RNA
It stands for deoxyribonucleic acid.	It stands for ribonucleic acid.
It consists of deoxyribose sugar.	It consists of ribose sugar.
Bases: Adenine, Guanine, Cytosine and Thymine	Bases: Adenine, Guanine, Cytosine and Uracil
It is mainly found in chromosomes in the nucleus of cell.	It occurs mainly in cytoplasm.
It is double stranded polynucleotide chain.	It is single stranded polynucleotide chain.
It is genetic material and is responsible for transmission of hereditary character from parent cell to offspring.	It is the site of protein synthesis in the cytoplasm.

## G. Global Warming



Global warming is the gradual warming of the earth's atmosphere. It has resulted in an increase in the sea level. It has also led to changes in climatic conditions all over the world. Warming and cooling of the earth's atmosphere has been a natural phenomenon. It has occurred over the ages but the warming of the atmosphere in the last few decades had been faster than before. The atmospheric temperatures have gone off by three times the average for the 20<sup>th</sup> century since 1970. Global warming has been attributed to the increased emission of greenhouse gases. The increase in the amount of green house gases has made earth warmer than usual. It is also causing great problems for the survival of plant Earth.

### Greenhouse Gases

Greenhouses that contribute to warming are known as greenhouse gases. Water vapor is the most abundant greenhouse gas, followed by carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), halogenated fluorocarbons (HCFCs), ozone (O<sub>3</sub>), per fluorinated carbons (PFCs), and hydro fluorocarbons (HFCs). Green house gases increase due to various human activities such as combustion of coal, oil, and gas. Every year, humans add over 30 billion tons of carbon dioxide in the atmosphere. Methane traps 20 times more heat than carbon dioxide and each year 350-500 million tones of methane are added to the air. The amount of nitrous oxide is also increasing by 7-13 million tones

every year. Greenhouse gases absorb the infrared radiation in the Earth's atmosphere. The greenhouse gases act as a natural blanket to the Earth.

### **Indicators of Warming**

There have been several indicators of global warming such as borehole temperature, melting snow cover, and receding glaciers. Since glaciers are at higher altitudes, the recession of glaciers provide more insight into temperature changes at higher atmosphere. The global sea level has increased at an average rate of 1-2 mm | year over the past 100 year.

### **Predictions about Climate**

Global surface temperatures have increased by about 0.6 C since the late 19<sup>th</sup> century, and by about 0.2 – 0.3 c over the past 25 years. Current forecasts and studies have predicted that global temperatures will rise between 3.5 and 8 F and sea levels are likely to rise between 17.5 cm and 57.5 cm by 2100 if the emission of greenhouse gases is not controlled.

### **Causes**

Global warming is caused by natural as well as man-made causes. Natural causes such as release of greenhouse gases by wetlands and cyclic climatic changes lead to increase in the amount of greenhouses gases. Man- made causes have played a major role in global warming. Burning of fossil fuels, mining coal, increase in population, and deforestation are a few of the many causes of global warming.

### **Effect of Global Warming**

The change in climate affects people, plants, and animals. Scientists have already observed many changes because of global warming such as sea level rise, shrinking glaciers, melting of permafrost, and trees blooming before time. Human health is also affected by climate change. Long periods of heat and cold and storms have increased climate-sensitive diseases such as malaria, dengue fever, yellow fever and encephalitis. Extreme temperatures can often lead to loss of life, ecological disturbances, and increases in the number of parasites. The increase in temperature has also increased the air and water pollution.

## H. Chemistry Appendix

### Elements Symbols and Atomic Number

Element	Symbol	Atomic Number	Element	Symbol	Atomic Number
Hydrogen	H	1	Lanthanum	La	57
Helium	He	2	Cerium	Ce	58
Lithium	Li	3	Praseodymium	Pr	59
Beryllium	Be	4	Neodymium	Nd	60
Boron	B	5	Promethium	Pm	61
Carbon	C	6	Samarium	Sm	62
Nitrogen	N	7	Europium	Eu	63
Oxygen	O	8	Gadolinium	Gd	64
Fluorine	F	9	Terbium	Tb	65
Neon	Ne	10	Dysprosium	Dy	66
Sodium	Na	11	Holmium	Ho	67
Magnesium	Mg	12	Erbium	Er	68
Aluminum	Al	13	Thulium	Tm	69
Silicon	Si	14	Ytterbium	Yb	70
Phosphorous	P	15	Iridium	Ir	71
Sulfur	S	16	Hafnium	Hf	72
Chlorine	Cl	17	Tantalum	Ta	73
Argon	Ar	18	Tungsten	W	74
Potassium	K	19	Rhenium	Re	75
Calcium	Ca	20	Osmium	Os	76
Scandium	Sc	21	Iridium	Ir	77
Titanium	Ti	22	Platinum	Pt	78
Vanadium	V	23	Gold	Au	79
Chromium	Cr	24	Mercury	Hg	80
Manganese	Mn	25	Thallium	Tl	81
Iron (Ferum)		26	Lead	Pb	82
Cobalt	Co	27	Bismuth	Bi	83

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Nickel	Ni	28	Polonium	Po	84
Copper	Cu	29	Astatine	At	85
Zinc	Zn	30	Radon	Rn	86
Gallium	Ga	31	Francium	Fr	87
Germanium	Ge	32	Radium	Ra	88
Arsenic	As	33	Actinium	Ac	89
Selenium	Se	34	Thorium	Th	90
Bromine	Br	35	Protactinium	Pa	91
Krypton	Kr	36	Uranium	U	92
Rubidium	Rb	37	Neptunium	Np	93
Strontium	Sr	38	Plutonium	Pa	94
Yttrium	Y	39	Americium	Am	95
Zirconium	Zr	40	Curium	Cm	96
Niobium	Nb	41	Berkelium	Bk	97
Molybdenum	Mo	42	Californium	Cf	98
Technetium	Tc	43	Einsteinium	Es	99
Ruthenium	Ru	44	Fermium	Fm	100
Rhodium	Rh	45	Mendelevium	Md	101
Palladium	Pd	46	Nobelium	No	102
Silver	Ag	47	Lawrencium	Lr	103
Cadmium	Cd	48	Rutherfordium	Rf	104
Indium	In	49	Dubnium	Db	105
Tin	Sn	50	Seaborgium	Sg	106
Antimony	Sb	51	Bohrium	Bh	107
Tellurium	Te	52	Hassium	Hs	108
Iodine	I	53	Meitnerium	Mt	109
Xenon	Xe	54	Ununnilium	Uun	110
Caesium	Cs	55	Unununium	Uuu	111
Barium	Ba	56	Unubium	Uub	112

**Some Important Ores****Iron**

Haematite	$\text{Fe}_2\text{O}_3$
Limonite	$2\text{Fe}_2\text{O}_3 \cdot 3\text{H}_2\text{O}$
Magnetite	$\text{Fe}_3\text{O}_4$
Siderite	$\text{FeCO}_3$
Iron Pyrite	$\text{FeS}_2$

**Copper**

Cuprite	$\text{Cu}_2\text{O}$
Copper Glance	$\text{Cu}_2\text{S}$
Copper Pyrite	$\text{CuFeS}_2$
Azurite	$2\text{CuCO}_3 \cdot \text{Cu}(\text{OH})_2$
Malachite	$\text{CuCO}_3 \cdot \text{Cu}(\text{OH})_2$

**Silver**

Argentite (Silver Glance)	$\text{Ag}_2\text{S}$
Horn Silver	$\text{AgCl}$
Ruby Silver	$3\text{Ag}_2\text{S} \cdot \text{Sb}_2\text{S}_3$
Silver Copper Glance	$\text{Ag}_2\text{S} \cdot \text{Cu}_2\text{S}$

**Calcium**

Lime Stone	$\text{CaCO}_3$
Gypsum	$\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$
Dolomite	$\text{CaCO}_3 \cdot \text{MgCO}_3$
Fluorspar	$\text{CaF}_2$
Phosphorite	$\text{Ca}_3(\text{PO}_4)_2$

**Aluminium**

Bauxite	$\text{Al}_2\text{O}_3 \cdot 2\text{H}_2\text{O}$
Diaspore	$\text{Al}_2\text{O}_3 \cdot \text{H}_2\text{O}$
Corundum	$\text{Al}_2\text{O}_3$
Felspar	$\text{K}_2\text{O} \cdot \text{Al}_2\text{O}_3 \cdot 6\text{SiO}_2$

**Lead**

Anglesite	$\text{PbSO}_4$
Cerussite	$\text{PbCO}_3$
Galena	$\text{PbS}$

**Mercury**

Cinnabar	$\text{HgS}$
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	Calomel	$\text{Hg}_2\text{Cl}_2$
<b>Tin</b>	Cassiterite	$\text{SnO}_2$
<b>Zinc</b>	Calamine	$\text{ZnCO}_3$
	Zinc Blende	$\text{ZnS}$
	Zincite	$\text{ZnO}$
<b>Sodium</b>	Sodium Chloride	$\text{NaCl}$
	Sodium Nitrate	$\text{NaNO}_3$
	Glauber's Salt	$\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$
<b>Manganese</b>	Pyrolusite	$\text{MnO}_2$
	Braunite	$\text{Mn}_2\text{O}_3$
	Hausmannite	$\text{Mn}_3\text{O}_4$
<b>Boron</b>	Borax	$\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$
	Colemarite	$\text{Ca}_2\text{B}_6\text{O}_{11} \cdot 5\text{H}_2\text{O}$

**Some Important Organic Compounds**

SN	Name	Formula	Uses/Occurrence
1.	Methane	$\text{CH}_4$	Chemicals, natural gas
2.	Ethane	$\text{C}_2\text{H}_6$	Fuel
3.	Propane	$\text{C}_3\text{H}_8$	Fuel
4.	Butane	$\text{C}_4\text{H}_{10}$	Fuel
5.	Octane	$\text{C}_8\text{H}_{18}$	Fuel
6.	Ethane, ethylene	$\text{C}_2\text{H}_4$	Chemicals, polythene
7.	Ethyne, acetylene	$\text{C}_2\text{H}_2$	Oxyacetylene welding
8.	Benzene	$\text{C}_6\text{H}_6$	Plastics, solvent
9.	Glucose	$\text{C}_6\text{H}_{12}\text{O}_6$	Jam, sweets, etc
10.	Lactose	$\text{C}_{12}\text{H}_{22}\text{O}_{11}$	Occurs in milk
11.	Sucrose	$\text{C}_{12}\text{H}_{22}\text{O}_{11}$	Beet sugar, can sugar
12.	Tetrachloromethane, carbon tetrachloride	$\text{CCl}_4$	Fire extinguishers, dry cleaning

13.	Trichloromethane, chloroform	$\text{CHCl}_3$	Solvent
14.	Fluorescein	$\text{C}_{20}\text{H}_{12}\text{O}_5$	Fluorescent dye
15.	Methanal, formaldehyde	$\text{HCHO}$	Preservative disinfectant
16.	Ethanal, acetaldehyde	$\text{CH}_3\text{CHO}$	Industrial chemicals
17.	Methanol, methyl alcohol	$\text{CH}_3\text{OH}$	Solvent
18.	Ethanol, ethyl alcohol	$\text{C}_2\text{H}_5\text{OH}$	Fuel, solvent
19.	Methanoic acid, formic acid	$\text{HCOOH}$	Textile industry
20.	Ethanoic acid, acetic acid	$\text{CH}_3\text{COOH}$	Chemicals, vinegar
21.	Lactic acid	$\text{CH}_3\text{CHOH}$ $\text{COOH}$	Food and textile industries
22.	Phenol, carboic acid	$\text{C}_6\text{H}_5\text{OH}$	Dyes, plastics
23.	Propanone, acetone	$\text{CH}_3\text{COCH}_3$	Chemicals, solvent
24.	Methylbenzene, toluene	$\text{C}_6\text{H}_5\text{CH}_3$	Chemicals, explosives
25.	Methylnitrobenzene, trinitrotoluene (TNT)	$\text{C}_6\text{H}_2\text{CH}_3(\text{NO}_2)_3$	Explosive

### Some Electrovalent or Ionic Compounds

S.N	Compound	Formula	Ions involved
1.	Aluminium oxide	$\text{Al}_2\text{O}_3$	$\text{Al}^{3+}$ and $\text{O}^{2-}$
2.	Aluminium fluoride	$\text{AlF}_3$	$\text{Al}^{3+}$ and $\text{F}^-$
3.	Ammonium chloride	$\text{NH}_4\text{Cl}$	$\text{NH}_4^+$ and $\text{Cl}^-$
4.	Ammonium sulphate	$(\text{NH}_4)_2\text{SO}_4$	$\text{NH}_4^+$ and $\text{SO}_4^{2-}$
5.	Barium chloride	$\text{BaCl}_2$	$\text{Ba}^{2+}$ and $\text{Cl}^-$
6.	Calcium chloride	$\text{CaCl}_2$	$\text{Ca}^{2+}$ and $\text{Cl}^-$
7.	Calcium oxide	$\text{CaO}$	$\text{Ca}^{2+}$ and $\text{O}^{2-}$
8.	Cupric chloride	$\text{CuCl}_2$	$\text{Ca}^{2+}$ and $\text{Cl}^-$
9.	Cupric sulphate	$\text{CuSO}_4$	$\text{Ca}^{2+}$ and $\text{SO}_4^{2-}$
10.	Potassium bromide	$\text{KBr}$	$\text{K}^+$ and $\text{Br}^-$
11.	Potassium nitrate	$\text{KNO}_3$	$\text{K}^+$ and $\text{NO}_3^-$
12.	Magnesium chloride	$\text{MgCl}_2$	$\text{Mg}^{2+}$ and $\text{Cl}^-$
13.	Magnesium oxide	$\text{MgO}$	$\text{Mg}^{2+}$ and $\text{O}^{2-}$
14.	Sodium chloride	$\text{NaCl}$	$\text{Na}^+$ and $\text{Cl}^-$

## Some Covalent Compounds

S.N	Compound	Formula	Element involved
1.	Alcohol	C <sub>2</sub> H <sub>5</sub> OH	C, H and O
2.	Ammonia	NH <sub>3</sub>	N and H
3.	Carbon dioxide	CO <sub>2</sub>	C and O
4.	Carbon disulphide	CS <sub>2</sub>	C and S
5.	Carbon tetrachloride	CCl <sub>4</sub>	C and Cl
6.	Cane sugar	C <sub>11</sub> H <sub>22</sub> O <sub>11</sub>	C, H and O
7.	Ethane	C <sub>2</sub> H <sub>6</sub>	C and H
8.	Ethene	C <sub>2</sub> H <sub>4</sub>	C and H
9.	Ethyne	C <sub>2</sub> H <sub>2</sub>	C and H
10.	Glucose	C <sub>6</sub> H <sub>12</sub> O <sub>6</sub>	C, H and O
11.	Hydrogen chloride gas	HCL	H and Cl
12.	Hydrogen sulphide gas	H <sub>2</sub> S	H and S
13.	Methane	CH <sub>4</sub>	C and H
14.	Urea	CO(NH <sub>2</sub> ) <sub>2</sub>	C, O, N and H
15.	Water	H <sub>2</sub> O	H and O

## Common Name and Chemical Names of Some Compounds

SN	Common Name	Chemical Name	Chemical Formula
1.	Dry Ice	Solid Carbon dioxide	CO <sub>2</sub>
2.	Slaked Lime	Calcium hydroxide	Ca(OH) <sub>2</sub>
3.	Bleaching Powder	Calcium oxychloride	CaOCl <sub>2</sub>
4.	Caustic Soda	Sodium Hydroxide	NaOH
5.	Rock salt	Sodium chloride	NaCl
6.	Caustic Potash	Potassium Hydroxide	KOH
7.	Potash Alum	Potassium Aluminium Sulphate	K <sub>2</sub> SO <sub>4</sub> . Al <sub>2</sub> (SO <sub>4</sub> ) <sub>3</sub> . 24H <sub>2</sub> O
8.	Epsom Salt	Magnesium Sulphate	MgSO <sub>4</sub> . 7H <sub>2</sub> O
9.	Quick Lime	Calcium Oxide	CaO
10.	Plaster of Paris	Calcium Sulphate	(CaSO <sub>4</sub> ) <sub>2</sub> . H <sub>2</sub> O
11.	Gypsum	Calcium Sulphate	CaS. 2H <sub>2</sub> O
12.	Green Vitriol	Ferrous Sulphate	FeSO <sub>4</sub> . 7H <sub>2</sub> O
13.	Blue Vitriol	Copper Sulphate	CuSO <sub>4</sub> . 5H <sub>2</sub> O
14.	White Vitriol	Zinc Sulphate	ZnSO <sub>4</sub> . 7H <sub>2</sub> O
15.	Marsh Gas	Methane	CH <sub>4</sub>

16.	Vinegar	Acetic Acid	$\text{CH}_3\text{COOH}$
17.	Potash Ash	Potassium Carbonate	$\text{K}_2\text{CO}_3$
18.	Hypo	Sodium Thiosulphate	$\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$
19.	Baking Soda	Sodium Bicarbonate	$\text{NaHCO}_3$
20.	Washing Soda	Sodium Carbonate	$\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$
21.	Magnesia	Magnesium Oxide	$\text{MgO}$
22.	Chalk (Marble)	Calcium Carbonate	$\text{CaCO}_3$
23.	Laughing Gas	Nitrous Oxide	$\text{N}_2\text{O}$
24.	Lunar Caustic	Silver Nitrate	$\text{AgNO}_3$
25.	Borax	Sodium tetraborate hydrate	$\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$
26.	Alcohol	Ethyl alcohol	$\text{C}_2\text{H}_5\text{OH}$
27.	Sugar	Sucrose	$\text{C}_{12}\text{H}_{22}\text{O}_{11}$
28.	Heavy Water	Duterium Oxide	$\text{D}_2\text{O}$
29.	Sand	Silicon Oxide	$\text{SiO}_2$
30.	Bone ash	Calcium Phosphate	$\text{Ca}_3(\text{PO}_4)_2$
31.	Tear Gas	Chloropicrin	$\text{CCl}_3\text{NO}_2$
32.	Common Salt	Sodium Chloride	$\text{NaCl}$
33.	Salt Cake	Sodium Sulphate	$\text{Na}_2\text{SO}_4$
34.	Aspirin	Acetyl-Salicylic acid	$\text{CH}_3\text{CO}_2\text{C}_6\text{H}_4\text{COOH}$
35.	Charcoal	Calcium phosphate plus carbon	$\text{Ca}_3(\text{PO}_4)_2\text{C}$
36.	Clay	Hydrated ferric Oxide	$\text{H}_2\text{Al}_2(\text{SiO}_4)_2 \cdot \text{H}_2\text{O}$
37.	Pyrite	Iron Disulphide	$\text{FeS}_2$
38.	Milk of magnesia	Magnesium Hydroxide	$\text{Mg}(\text{OH})_2$
39.	Philosophers wool	Zinc Oxide	$\text{ZnO}$
40.	Calomel	Mercurous Chloride	$\text{HgCl}$

### Some Important Chemical Processes

Bosch Process	– Hydrogen
Down Process	– Manufacture of Na
Nelson Cell	– Manufacture of NaOH
Ammonia Soda Process	– Manufacture of $\text{Na}_2\text{CO}_3$ and $\text{NaHCO}_3$
Leblanc Process	– Manufacture of $\text{K}_2\text{CO}_3$
Parke's Process	– Manufacture of Ag
Cupellation Process	– Purification of Ag
Baeyer's Process	– Manufacture of Al

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Carter Process	– Manufacture of basic lead carbonate
Haber's Process	– Synthesis of $\text{NH}_3$
Ostwald Process	– Synthesis of $\text{NO}$ , $\text{HNO}_3$
Contact Process	– Manufacture of $\text{H}_2\text{SO}_4$
Dow's Process	– Manufacture of Phenol, Mg

### Some Important Chemistry Facts

Element which constitutes 90% of mass of sun:	Hydrogen
Most abundant element in the Universe:	Hydrogen
Most abundant element on the earth's crust:	O, Si, Al
Element stored under water:	Phosphorus
Element stored under kerosene: Liquid Paraffin:	Na, K, Rb, Cs
Lightest metal:	Lithium
Smallest atomic size:	Hydrogen
Highest electronegativity:	Fluorine
Lowest electronegativity:	Cesium
Highest ionization potential:	Helium
Lowest ionization potential:	Cesium
Highest electron affinity:	Chlorine
Lowest electron affinity:	Noble gases
Least electropositive element:	Fluorine
Metal with lowest melting point:	Mercury
Element with lowest melting and boiling point:	Helium
Metal with highest melting and boiling point:	Tungsten
Non-metal with highest melting & boiling point:	Diamond
Most reactive gaseous element:	Fluorine
Most reactive liquid element (Metal):	Cesium
Largest anion:	Astatine ion
Smallest anion:	$\text{F}^-$
Total number of gaseous elements:	11

## I. Questionnaire

1. Who is the father of the modern chemistry? – Antonie Lavoiser
2. Name the substance known as super liquid – Liquid helium
3. In how many stages does the matter exist in the earth? – Three(solid, liquid and gas)
4. Name the fourth stage of matter that exist in stars as highly ionized gas – Plasma
5. Change of state of matter from solid to liquid is known as – Melting
6. Change of state of matter from liquid to solid is known as – Freezing
7. Change of state of matter from liquid to gas is known as – Boiling
8. Change of state of matter from solid to gas is known as – Sublimation
9. The simplest form of a pure substance is known as – Element
10. Total number of elements that exists in the earth – More than 105
11. Total number of natural elements found in the earth – 92
12. Name the elements that exists in liquid state – Mercury, Bromine and Francium
13. Substance formed by combination of two or more elements -Compound
14. The smallest unit of an element is – Atom
15. Name the discoverer of atom – John Dalton
16. One atomic mass is equivalent to the mass of which element atom – Hydrogen ( $1.67 \times 10^{-24}$ g)
17. One atomic mass unit is equivalent to  $1/12^{\text{th}}$  of a carbon atom. i.e., sodium mass is 23 means sodium is 23 times heavier than  $1/12^{\text{th}}$  of a carbon – 12 atom
18. Atom consists of ..... – Protons and Neutrons
19. Who discovered electrons? – J.J Thomson
20. What is the mass of an electron? –  $1.6 \times 10^{-19}$  coulombs
21. Who discovered neutrons? – Chadwick
22. Number of proton or number of electron in an atom is known as – Atomic number of atom
23. Total number of proton and neutron in atom is known as – Mass number
24. Atoms of same element having same atomic number but different atomic mass is known as – Isotopes(i.e,  ${}^{14}\text{C}$  &  ${}^{12}\text{C}$ )
25. Two or more elements having same atomic mass but different atomic number is known as – Isobars
26. The extreme temperature at which molecules stop motion inside any state of matter is known as – Absolute zero ( $-273.16^{\circ}\text{C}$ )

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27. The compound used in coating photographic films – Silver bromide (AgBr)
28. The poisonous compounds released during Acid rains in Air polluted cities
29. What is corrosion? – Metals exposed to atmosphere get in contact with air and Water to Form undesirable compound on surface know as corrosion.
30. Corrosion Of iron is known as – Rusting
31. Name the metals that does not undergo corrosion – Gold, Platinum and Silver
32. Rusting of iron is Chemically known as – Hydrated form of ferric oxide ( $\text{Fe}_2\text{O}_3 \times \text{H}_2\text{O}$ )
33. The process of coating iron with Zinc to prevent rusting is known as – Galvanization
34. The element most abundant in the earth's crust – Oxygen
35. The element most abundant in the earth's atmosphere – Nitrogen (78%)
36. The element most abundant in the sea water – Chloride
37. The element most abundant in the universe – Hydrogen & Halogen
38. Total number of Non- metals existing in the earth – 22 (11 gas, 10 solids, 1 liquid)
39. the only liquid non metal existing in the earth – Bromine
40. Lightest element that is added to the vegetable oil in the presence of nickel to make vanaspathi ghee – Hydrogen
41. What is heavy water? – It is a Hydrogen compound ( $\text{H}_2\text{O}$ ) used in nuclear reactors for slowing down the fast moving neutrons
42. The first element in the periodic table – Hydrogen
43. Why hydrogen is not used in balloon even though it is lightest of all gases? – because hydrogen catches fire easily
44. Name the scientist who discovered the chemical content of water – Cavendish
45. Name the purest form of natural water – Rain water
46. Name the most abundant isotope of hydrogen – Protium
47. Name the two types of hard water – Temporary hard water and permanent hard water
48. Temporary hardness of water is due to the presence of – Bicarbonates of calcium and magnesium salts
49. Temporary hardness of water can be removed by – Boiling water or Adding lime
50. Permanent hardness of water is due to the presence of – Soluble calcium or Magnesium salts
51. Permanent hardness of water can be removed by – Adding washing soda

52. The layer in the atmosphere that protects the earth from ultra violet rays – Ozone layer
53. Name the color of ozone – Blue
54. When electrical apparatus produce spark what gas is formed in nearby surrounding air – Ozone
55. Which acid is known as King of Acid widely used in the modern industries? – Sulphuric acid ( $\text{H}_2\text{SO}_4$ )
56. Percentage of nitrogen in the earth's atmosphere – 78%
57. The gas which dilutes oxygen in atmosphere to moderate burning and respiration – Nitrogen
58. Proteins and nucleic acids in living beings contain – Nitrogen
59. Name the plants which has the capacity to derive nitrogen from the atmosphere – Leguminous plants
60. Ammonia ( $\text{NH}_3$ ) compound of nitrogen and hydrogen is produced through the process known as – Habbers process
61. How is glass made? – Glass is made by heating silicon dioxide (sand) with sodium carbonate ( $\text{Na}_2\text{CO}_3$ ) and calcium carbonate ( $\text{CaCO}_3$ ) at a temperature of 1500c
62. The chemical used for purifying water – Chlorine
63. The chemical used in tooth paste and frying pans (Teflon) – Fluorine
64. The chemical used for the treatment of wound and used for curing thyroid – Iodine
65. The gas used in flying balloons – Helium
66. The only liquid metal found in earth surface – Mercury
67. The most malleable (can be beaten into sheets) metal in the earth – Gold
68. The metal which is the best conductor of heat and electricity – Silver
69. The metal which is the poorest conductor of heat and electricity –lead
70. The only metal in earth which exist in free state – Gold, Silver and Platinum
71. Mixture of two or more metals is known as – Alloy
72. Name the important ores from which iron is extracted – Hematite and iron pyrite
73. Name the purest form of iron – Wrought iron
74. Name the three forms of iron – a) Cast iron or Pig iron b) Wrought iron c) Steel
75. Which element is the basis of life on earth – Carbon
76. The element contained in the maximum group of compounds – Carbon
77. Carbon and its branch of chemistry is known as – Organic chemistry



78. The purest form of carbon existing in the earth – Diamond
79. From which kind of rock diamond is extracted – Igneous rock
80. The form of carbon used in making pencil lead – Graphite
81. Dry ice used to create artificial fog in cinema is – Solid carbon dioxide
82. Name the four forms of coal – Lignite, Bituminous, Peat and Anthracite
83. Purest form of coal having maximum carbon content – Anthracite
84. Name the contents of gun powder – Potassium nitrate, sulphur and charcoal
85. Compounds only containing hydrogen and carbon is known as – Hydro carbons
86. Simplest form of Hydro carbon – Methane ( $\text{CH}_4$ )
87. Hydro carbon which has maximum heat content – Methane
88. What is the other name of methane? – Marsh gas
89. Hydro carbon contained in Bio gas and Gobar gas – Methane
90. Name the group to which alcohol belongs – OH group
91. Alcohol suitable for consumption is known as – Ethanol ( $\text{C}_2\text{H}_5\text{OH}$ )
92. Name the poisonous alcohol if consumed leads to death – Methanol
93. Substances that reacts with both acid and base are known as – Amphoteric
94. What is the PH of water? – 7
95. What is the PH of human body? – 7.5
96. The process of adding sulphur with natural rubber to make it hard and elastic is known as – Vulcanization
97. What is Synthetic rubber? – Polymer of Chloroprene
98. First synthetic fibre made by man – Nylon
99. Which type of dress is safe to wear during cooking? – Made of cotton
100. The chemical used in fire extinguisher to put fire caused by oils – Foam extinguisher ( $\text{CO}_2$ , sand and soil)
101. The chemical used in electrical fire extinguisher used in putting fire caused by electric short circuit – Carbon Tetra Chloride
102. Cement is made up of – Lime ( $\text{CaO}$ ), Alumina ( $\text{Al}_2\text{O}_3$ ) and Silica ( $\text{SiO}_2$ )
103. Soaps are known as – Sodium salts of high fatty acids
104. Detergents are known as – Sodium salts of alkyl or Sulphonic acids
105. Pyrex glass is made up of – Salts of Zinc and Barium
106. Flint glass used for making lenses of microscopes, camera, Telescope is made up of – Silica, Potassium carbonate and Lead oxide
107. The whitest substance known in the world is – Titanium dioxide
108. What is the chemical composition of silk? – Protein molecules

109. Chemical used for purifying water – Bleaching powder
110. Which is the most soluble gas in the water – Ammonia
111. Name the chemical used in producing metal fibres – Aluminium, Plastic
112. Which compound has the highest solubility in water? – Sulphur dioxide
113. The most stable allotropic form of sulphur – Rhombus sulphur
114. Name the acid not containing oxygen – Hydrochloric acid
115. The major element in the constitution of protein – Nitrogen
116. The most active element found in the nature – Fluorine
117. The salt required for production of gun powder – Potassium nitrate
118. The rare metal used in the production of pant – Titanium
119. The artificial fertilizer containing the largest quantity of potassium – Muriate of potash
120. Which is the universal solvent? – Water
121. Name the scientist who established the formulae of rubber? – Michael Faraday
122. The chemical name for dynamite – Glycerine trinitrate
123. Which disease is treated by radio cobalt – Cancer
124. The instrument used to measure the intensity of radiation – Gieger Muller Counter
125. The gas which turns the lime water milky – Carbon dioxide
126. A chemically inactive artificial fibre – Teplon
127. What kind of steel is used for making blade – High carbon steel
128. Name the laboratory where the first atom bomb was made – LOS Alamos (America)
129. The most abundant variety of uranium found in nature –  $U^{228}$
130. When was the first hydrogen bomb tested? – 1<sup>st</sup> Nov. 1952 in Marshal Island
131. The acid found in lemon foot – Citric acid
132. The acid present in butter milk – Lactic acid
133. Name the two metals kept in kerosene – Sodium and Potassium
134. Name the metal kept in water – Yellow phosphorous
135. Name the salt used in making ink – Ferrous Sulphate
136. Name the metal that pollutes the city having large number of auto mobiles – Lead
137. What is the chemical name of laughing gas – Nitrous Oxide
138. The first organic compound to be synthesized in the laboratory – Urea
139. What is the combustible material used on the tip of the safety match sticks – Antimony Sulphide
140. How many carats does the purest form of gold contain – 24 carat
141. Name the metal mixed with gold to make ornaments – Copper

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142. Milk and egg though known as complete food lacking vitamin – Vitamin C
143. Alloys in which mercury is a metal known as – Amalgam
144. Element present in chlorophyll – Magnesium
145. Milk when converted to chard has sour tasted due to the presence of – Lactic acid
146. The most important chemical constituents of bones and teeth of animals – Calcium Phosphate
147. Hottest part of gas flame is known as – Non-luminous zone
148. The chemical used for preserving food – Benzoic acid
149. IC chips used in computers are made up of – Silicon
150. Excess of iron in human body lead to disease known as – Wilson`s disease
151. Lightest metal in the earth – Lithium
152. Heaviest metal in the earth – Uranium
153. The reaction between phenol and  $\text{CO}_2$  is called – Kolbe`s Synthesis
154. In green house effect, Methane causes – absorption of heat
155. Methane is formed due to the hydrolysis of – Aluminum Carbide
156. The disaccharide present in milk is called? – Lactose
157. The spectral region for the Lyman series of hydrogen spectrum is in the – Ultra-Violet Region
158. The process in which amides are changed into amines is called – Hoffmann`s reaction
159. Chlorine reacts with Benzaldehyde to give – Chlorobenzene
160. Tear gas is – Chloropicrin
161. What is the molecular formula of Mohr`s salt? –  $(\text{NH}_4)_2\text{SO}_4 \cdot \text{FeSO}_4 \cdot 6\text{H}_2\text{O}$
162. Optical activity is measured is measured by – Polari meter
163. The fineness of lime stone in the extraction of iron in blast furnance is to act as – flux
164. Teflon is the polymer of – Tetraflouroethene
165. The reaction to prepare Salicynaldehyde from phenol is known as – Reimer-Tiemann Reaction
166. Reaction taking place at anode is – Oxidation
167. The catalyst used in the manufacture of ammonia – Fe
168. Which gas causes acid rain –  $\text{SO}_2$
169. Which acid is found only in milk fat? – Butyric acid
170. Which non-metallic element remains liquid at normal room temperature? – Bromine

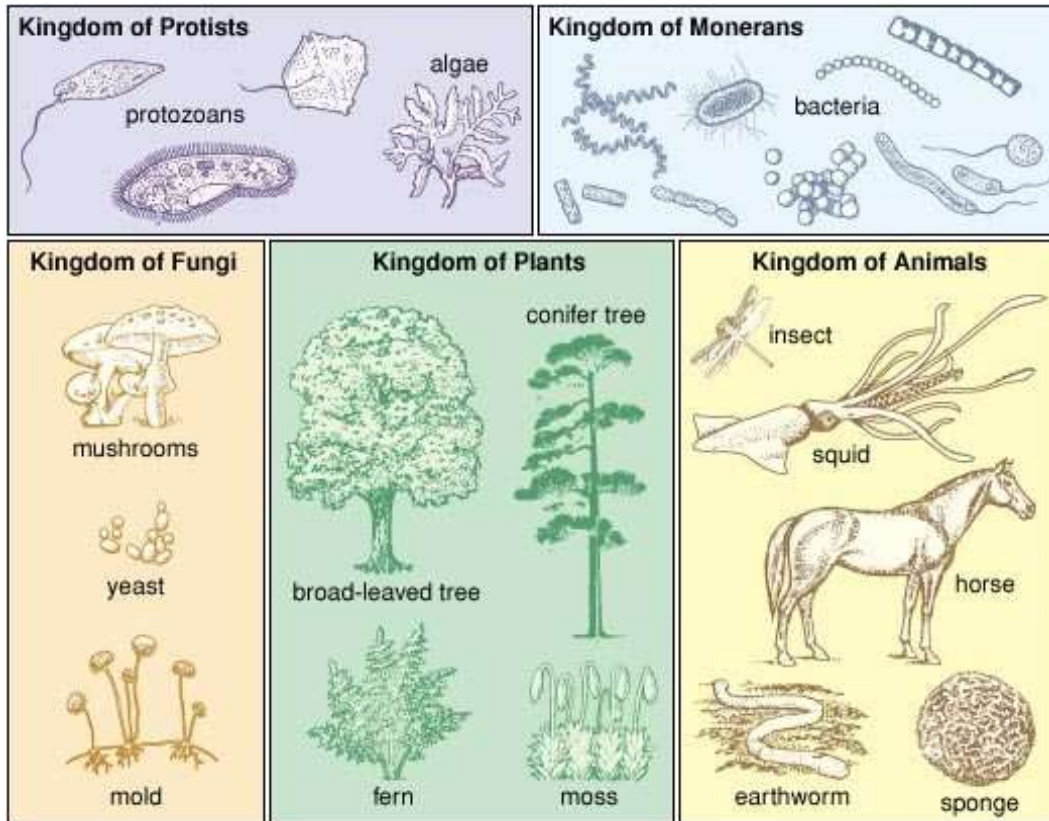
## Biology



Biology is the study of all living organisms and their life on the earth. It is the science of life. Biology includes the study of the structure, function, growth, origin, evolution, and distribution of all living organisms. Biology is divided into two major branches Botany and Zoology. Botany studies plant life and zoology studies animal life. Other biological disciplines include physiology, cytology, embryology, ecology, anatomy, morphology, genetics, histology, taxonomy, biochemistry and molecular biology. The aim of the biology is to explain the living world in terms of scientific principles. Hippocrates and Aristotle were the first people to study the life in a systematic and scientific manner. But the term Biology was first coined by Lamark and Treviranus in 1802.

Aristotle (384-322) started the scientific study of living organism for the first time. He is the father of Biology, Zoology and Embryology. He described the different aspects of plants and animals in his book "Historia Animalium". Similarly, Theophrastus performed the first scientific study of the plants. So, he is known as the father of Botany. Hippocrates is the father of medicine and Carolous Linnaeus is the father of taxonomy. Many scientists, biologist and naturalists have major contributions in the field of biology. Some of them are; Robert Hooke, Charles Darwin, Gregor Johann Mendel, Antony Van Leeuwenhoek, and so on.

## A. Five Kingdom Classifications of Living beings



Once upon a time, all living things were lumped together into two kingdoms, namely plants and animals. Animals included every living thing that moved, ate, and grew to a certain size and stopped growing. Plants included every living thing that did not move or eat and that continued to grow throughout life. It became very difficult to group some living things into one or the other, so early in the past century the two kingdom system of Carolus Linnaeus was expanded into five kingdoms by R.H. Whittaker(1969): Monera (the prokaryotes); Protista (the single-cellular eukaryotes); Fungi (fungus and related organisms); Plantae (the plants); Animalia (the animals). Many biologists now recognize six distinct kingdoms, dividing Monera into the Eubacteria and Archeobacteria but it has not still been globally accepted.

Kingdoms are divided into categories called phyla; each phylum is divided into classes, each class into orders, and each order into families, each family into genera, and each genus into species. A species represents one type of organism, such as dog, tiger, shark,

*Ameoba proteus* (the common amoeba), *Homo sapiens* (us; human being), or *Acer palmatum* (Japanese maple). Note that genus and species names should be underlined or written in italics.

### **Monera**

The kingdom monera includes all the simplest, prokaryotic and microscopic forms of life which are thought to be the most earliest and primitive group of organisms. Monerans are the most numerous living organisms on the earth. And it was termed by Ernest Haeckel.

Individuals are single celled (unicellular), may or may not move, have a cell wall, have no chloroplasts or other organelles, and have no well developed nucleus. They contain circular double stranded naked DNA as the nuclear body in the cytoplasm. Monera are cosmopolitan in distribution and found in all types of habitat. They have no visible feeding mechanism but absorb nutrients through the cell wall (heterotrophic mode) or produce their own food by photosynthesis (autotrophic mode). Many monerans are important decomposers and mineralizes. Some of them are the important nitrogen-fixers too. Kingdom Monera has two groups; Archaeobacteria (ancient bacteria) and Eubacteria (Cyanobacteria, Bacteria, Actinomycetes, Rickettsia, Chlamydia and Mycoplasma). Examples: *Nostoc*, *E. coli*, *Anabaena*, *Lyngbea*, etc.

### **Protista**

The kingdom protista includes unicellular, eukaryotic and microscopic organisms. These are believed to be evolved from prokaryotic monerans and are the precursors from which higher eukaryotic kingdoms; Fungi, Plantae and Animalia have evolved. And it was also coined by E. Haeckel.

Individuals are single celled and usually move by cilia, flagella, or by amoeboid mechanisms. They have a typical eukaryotic cellular organization that possess a true nucleus and membrane bound organelles like mitochondria, endoplasmic reticulum, golgi bodies, ribosome, etc. There is usually no cell wall, although some forms may have a cell wall. They may have plastids and chloroplasts, so some will be green and others won't be. Nutrients are acquired by photosynthesis, ingestion of other organisms, or both. They reproduce by both asexual and sexual methods. And their development does not include embryo. Kingdom Protista has been classified into three groups; Photophyta, Slime moulds and Protozoa. The study of protozoans is called protozoology. Examples: *Amoeba*, *Euglena*, *Plasmodium vivax*, etc

### **Mycota (Fungi)**

The kingdom mycota includes moulds, mushrooms, puffballs and bracket fungi. The term Fungi was given by Gaspard Bauhin. The study of fungi is called Mycology (Mycetology). And Pier Antonio is the father of mycology.

Individuals are multi cellular with a cell wall made up of chitin, organelles including a nucleus (eukaryotic), but no chloroplasts (non-photosynthetic or non-green). They have no mechanisms for locomotion. Nutrients are acquired by absorption (they are heterotrophic). For the most part, fungi acquire nutrients from decaying materials (saprophytic). Some fungi are parasitic which cause disease in plants and animals (*Puccinia*). They store reserve food material in the form of oil and glycogen. They reproduce through vegetative, asexual and sexual methods. Based on types of sexual spores and nature of mycelium, fungi have been classified into five classes; Deuteromycetes (fungi imperfectii), Oomycetes (egg fungi), Zygomycetes (algal or conjugation fungi), Ascomycetes (sac fungi) and Basidiomycetes (club fungi). Examples: *Saccharomyces cerevisiae*, *Mucor*, *Alternaria*, *Agaricus campestris*, etc.

### **Plantae**

The kingdom plantae is one of the larger kingdom containing more than 0.4 million organisms. It includes all the green (or colored) multicellular photosynthetic plants present on lands, seashores and in lakes, streams, rivers, etc. These include algae, bryophytes, pteridophytes, gymnosperms and angiosperms.

Individuals are multi cellular, eukaryotic with chlorophyll and most don't move, although gametes of some plants move using cilia or flagella. Their cells have a large central vacuole and rigid cell wall. The cell wall is made up of cellulose. They store reserved food material in the form of starch. Nutrients are acquired by photosynthesis; in case some plants may be heterotrophic feeding on other organisms (*Cuscuta*). They all have two generations in their life cycle – haploid gametophytic and diploid sporophytic generations. This two generation lie alternate to each other. Examples: *Spirogyra*, *Marchantia*, *Pinus*, *Pisum sativum*, *Zea mays*, etc

#### **Importance of Forests**

Some plants are very small and some are tall trees. Trees cover 29.6 percent of earth's total land area in the form of forest. The Giant Sequoia tree is the biggest living thing on earth. This tree also has the largest known stem volume of 1474 m<sup>3</sup>. Forest form an important part of the ecosystem. They shape the environment and helps in the regulation

of the climate. Trees and plants purify the air by producing oxygen. Forests are the major source of various natural resources and raw materials.

Forests cover 29.6 % of the earth's land area and almost a quarter of these are in Russia. Three main types of forest grow in particular climates in different parts of the world. **Tropical forests** or rain forests grow near the Equator where it is always hot and wet. Here, temperature is about 20-25<sup>0</sup>C and there is more than 200 cm of rain a year. **Temperate forests** grow in places that have hot summers and cold winters. The summers can be as hot as 30<sup>0</sup>C and winters as cold as -30<sup>0</sup>C. Average rainfall is about 75-150 cm a year. Many of the trees are deciduous - they lose their leaves in autumn and grow new ones in spring. **Taiga forests** grow in Russia, Canada and elsewhere in the far north. Winters are long and very cold. There is rainfall of 40-100 cm a year, but most fall as snow. Most trees are evergreen conifers. These are cone-producing trees with needle like leaves.

**Primary Source of Food:** The green color of plants is due to the presence of a green pigment called chlorophyll. It is the most important feature of plants. Plants use chlorophyll to capture light energy for manufacturing food in the form of sugar, starch, and other carbohydrates. Life on Earth would not be possible without these food sources. All the human beings and animals depend upon directly or indirectly for their survival on plants products such as, fruits, vegetables, and grains. Therefore, plants are an important part of the food chain. Beverages like, coffees, tea, wine, beer, and alcohols are derived from plants. Cooking oils like soybean oil, canola oil, sunflower oil, and olive oil are also obtained from plants. Sugar is obtained mainly from sugar cane and sugar beet.

**Source of Oxygen:** Plants are the primary source of oxygen on Earth. The leaves are the major organs of a plant that manufacture food using sunlight, carbon dioxide, and water and release oxygen as a byproduct called photosynthesis. Plants play a major role in sustaining life on Earth by releasing oxygen into the atmosphere.

**Plants Products:** Plant products are used for different purpose. They include wood, cloth, fossil fuels, herbal supplements, medicines, fibers, oils, dyes, pigments, waxes, latex, gums, resins, amber, and crock. Soaps, paints, shampoos, perfumes, cosmetics, pesticides, rope, turpentine, rubber, varnish, lubricants, plastics, inks, and chewing gums are also manufactured using plant resources. Plants are useful in other many ways too. Paper, cloth, and even houses are made from certain plants. Several plants also have medicinal uses. Ayurveda is entirely based on medicinal plants.



## Animalia

The kingdom animalia includes all multi cellular animals showing eukaryotic organization. They are also known as metazoans and include invertebrates and vertebrates beginning from sponges to mammals.

Individuals are multi cellular and move with the aid of cilia, flagella, or muscular organs based on contractile proteins. They are capable of showing locomotion due to the contraction and relaxation of muscles cells except sponges. They have organelles including a nucleus, but no chloroplasts or cell walls. Animals acquire nutrients by ingestion (heterotrophic; because they lack chlorophyll). They are the consumers of any ecosystem. They have reserve food material in the form of glycogen. They show quick response to external stimuli through the transmission of nerve impulse by nerve cells. Sponges lack nerve cells. Their development cycle includes embryonic stage. Examples: *Panthera tigris*, *Rana tigrina*, *Macaca mulata*, *Canis familiaris*, *Homo sapiens*, etc.

### Classification of Animal

It is believed that there may be around 30 million species of animals living on Earth. All animals are quite similar to each other in characteristics though they are made up of billions of cells. They vary in shape and size, from the tiny mosquito to the gigantic blue whale. They are different from other groups of living organisms such as plants, fungi, and bacteria. However, they have special sense to feel and react.

The animal kingdom is divided into vertebrates (with backbones) and invertebrates (without backbones). Vertebrates include amphibians, reptiles, birds, and mammals. The most common invertebrates include the protozoa, annelids, echinoderms, mollusks, and arthropods. The four basic categories of animals classified based to their diet (type of food they eat, how they eat, and from where they get their food) are carnivores, herbivores, omnivores, and scavengers. Carnivores are meat-eating animals as they eat other animals. Tigers, lions, dogs, and cats are carnivores. Herbivores are plant-eating animals as they feed on plants. Goats, horses, and cows are herbivores. Omnivores, like human consume both plants and animals. In addition, the animals that feed on dead plants are scavengers. Vultures are scavengers.

**Mammals:** Mammals are warm-blooded, vertebrate animals. Warm-blooded animals keep their body temperature at a constant level. Mammals are characterized by the presence of sweat glands and hairs. Most mammals' offspring live inside their mothers before they are born, as in the case in humans. They also produce milk. There are only

about 4000 kinds of mammals. The common examples of mammals are man, lion, tiger, dog, cat, cow, ox, rat and elephant.

**Insects:** Insects are small invertebrate animals. They have segmented bodies, joint legs, and a hard exoskeleton. They vary widely in shape and size. They vary from ants, bees, flies butterflies to beetles, moths, grasshoppers, lice, crickets, termites, etc. they make up more than half of all the living things. The most common sources of food for insects are nectar from plants. Many insects eat dead or decaying plants matter. Some insects like mosquitoes feed on blood. They live everywhere on earth however; very few species of insects live in the oceans.

**Corals:** Corals are small marine animals found in dense colonies under the oceans. They are made up of tiny fragile animals called coral polyps and skeletons. The corals colonies grow in many shapes and in many colors. The colonies are composed of many species of plants and animals. Corals can be further divided into hard and soft corals. Hard corals have a rock-like skeleton that is made up of calcium carbonate. The skeleton remains after the corals die. Soft corals do not have hard skeleton. They are thick and fleshy.

#### A mini key to determine the organism

Suppose you see something in freshwater that certainly appear to be living. How can you begin to determine what it is? Here is a key, not quite perfect that you might use to determine the kingdom to which it belongs.

1. Is it green or does it have green parts?
  - ✓ Yes - go to 2
  - ✓ No - go to 3
2. Could be a plant or a protist, or blue-green bacteria. Make sure that the green is really part of the organism. An animal might have eaten something green, for example.
  - ✓ Single-celled? - go to 6
  - ✓ Multi-cellular? - Plantae. Look for cell walls, internal structure in the compound microscope you might be able to see chloroplasts.
3. Could be a moneran (bacteria), protist, fungus, or animal.
  - ✓ Single-celled - go to 4
  - ✓ Multi-cellular (Look for complex or branching structure, appendages) - go to 5
4. Could be a moneran or a protist. Can you see any detail inside the cell?

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- ✓ Yes - Protista. You should be able to see at least a nucleus and/or contractile vacuole, and a definite shape. Movement should be present, using cilia, flagella, or amoeboid motion. Cilia or flagella may be difficult to see.
  - ✓ No - Monera. Should be quite small. May be shaped like short dashes (rods), small dots (cocci), or curved or spiral shaped. The largest them that are commonly found in freshwater are called Spirillum volutans. It is spiral shaped, and can be nearly a millimeter long. Except for Spirillum, it is very difficult to see Monerans except in a compound microscope with special lighting.
5. Animalia or Fungi. Is it moving?
- ✓ Yes - Animalia. Movement can be by cilia, flagella, or complex, involving parts that contract. Structure should be complex. Feeding activity may be obvious.
  - ✓ No - Fungus. Should be branched, colorless filaments. May have some kind of fruiting body (mushrooms are a fungus, don't forget). Usually attached to some piece of decaying matter - may form a fuzzy coating on or around an object. In water, some bacterial infections of fish and other animals may be mistaken for a fungus.
6. Most likely Protista. If it consists of long, unbranched greenish filaments with no apparent structure inside, it is blue-green bacteria, a Moneran.

Most green protists are flagellates, that is, they move rapidly with a spiraling motion. Unless you get them to stop, you can't really see the flagella. Watch out for colonial protists, though, such as Volvox, which forms a spinning ball of green cells. Don't be fooled into thinking it is a plant.

<b>Characteristics of Five Kingdom</b>						
<b>S N</b>	<b>Basis</b>	<b>Monera</b>	<b>Protista</b>	<b>Fungi</b>	<b>Plantae</b>	<b>Animalia</b>
1	Cell (types)	Prokaryotic	Eukaryotic	Eukaryotic	Eukaryotic	Eukaryotic
2	Cell Wall	Non Cellular (Polysaccharide +Amino acid)	Present in some (Various type)	Present (Non Cellulosic)	Present (Cellulose)	Absent
3	Nuclear membrane	Absent	Present	Present	Present	Present
4	Mitochondria	Absent	Present	Present	Present	Present
5	Chloroplast	Absent	Present in some	Absent	Present	Absent
6	Tissue or Multi- cellularity	Absent	Absent	Present but limited	Present in all forms	Present in all forms

7	Motility	Bacterial flagella, gliding or non motile	Cilia, Flagella, amoeboid contractile fibrils	Cilia, Flagella in some, none in most of the forms	Cilia, Flagella in lower forms, absent in the most of the forms	Cilia and flagella, contractile fibrils
8	Nervous System	Absent	Primitive for conducting stimuli	Absent	Absent	Present, often complex
9	Mode of nutrition	Autotrophic chemosynthetic and photosynthesis heterotrophic (saprophyte and parasite)	Photosynthetic and heterotrophic	Heterotrophic, Saprophytic Parasitic absorption	Autotrophic photosynthesis	Heterotrophic by ingestion
10	Reproduction / means of Genetic recombination	Conjugation Transduction Transformation or none	Syngamy and meiosis conjugation or none	Fertilization and meiosis dikaryosis or none	Fertilization and meiosis	Fertilization and meiosis

### Some Important Biological Facts

**Largest egg:** Egg of *Struthio camelus* (Ostrich)

**Largest animal:** *Balaenoptera musculus* (Blue whale); **Smallest animal:** *Babesia* (Protozoa)

**Largest terrestrial animal:** *Loxodonta africana* (African bush elephant)

**Largest bird:** *Struthio camelus* (Ostrich); **Smallest bird:** Bee hummingbird of Cuba

**Largest snake:** Giant anaconda; **Longest snake:** *Python reticulatus*

**Largest living lizard:** *Varanus komodoensis* (Monitor lizard); **Flying lizard:** *Draco*

**Largest living reptile:** *Crocodylus porosus* (Marine Crocodile)

**Largest teeth:** Tusk of elephant

**Smallest mammal:** *Etruscan shrew* (*Suncus etruscus*); **Flying mammal:** Bat

**Living fossil reptile:** *Sphenodon* (Tuatara)

**Flying fish:** *Exocoetus*

**Tallest tree:** *Sequoia gigantean* (gymnosperms)

**Tallest angiosperm:** *Eucalyptus*; **Smallest angiosperm:** *Wolffia* (called Duckweed)

**Smallest gymnosperm:** *Zamia pygmaea*

**Smallest living cell:** *Micoplasm gelisepticum* (PPLOs); **Largest sperm:** *Cycas*

**Largest flower:** *Rafflesia arnoldii*; **Smallest flower:** *Wolffia*

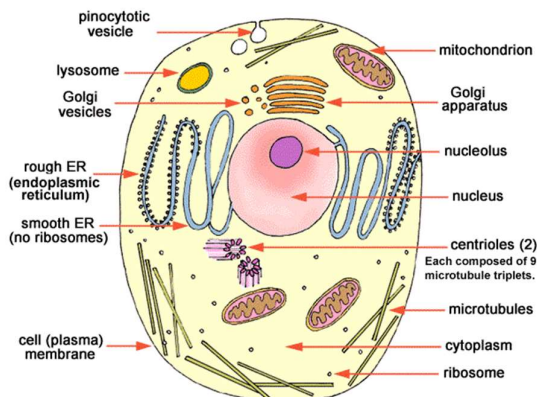
**Largest inflorescence:** *Puya raimandii*; **Largest leaf:** *Victoria regia*

**National flower of Nepal:** *Rhododendron arboretum*

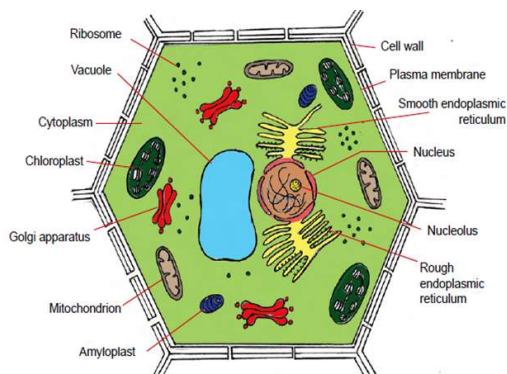
## B. The Cell

Cells are the basic structural and functional unit of all living organisms also regarded as the basic unit of biological activity. It is the simplest and smallest unit capable of carrying life activities. Each cell performs the basic functions of life such as respiration, reproduction, excretion, growth and so on. All the life activities exhibited by the living organisms are the result of combined action of these cells. In the unicellular organism, a single cell performs all the life activities. Organisms such as bacteria, parameciums are made up of single cells, called unicellular organisms. But human beings are made up of several cells so they are known as multi cellular organisms. The study of cell is called cytology and Robert Hooke first discovered the cell; he is the father of cytology.

There are two types of cells based on the presence of nucleus: prokaryotic and eukaryotic cells. Organisms with prokaryotic cells are prokaryotes and organisms with eukaryotic cells eukaryotes. Prokaryotes do not have a membrane-bound nucleus. The structure of a prokaryote is much simpler than that of a eukaryote. Eukaryotes possess membrane bound nuclei and other organelle. Most unicellular organisms are prokaryotes while most multi-cellular organisms are eukaryotes. The major similarity between prokaryotes and eukaryotes is that both have deoxyribose nucleic acid (DNA) as their genetic material.



A Eukaryotic Animal Cell



A Eukaryotic Plant Cell

### The Cell Theory

The German botanist, M.J. Schleiden and the Zoologist Theodar Schwann first propounded the cell theory in 1839. Biologist corrected and modified the cell theory given by Schleiden and Schwann and summarized it as follows.

- i. All living organisms are composed of small living units called 'cells'.
- ii. All cells are fundamentally similar in chemical compositions and metabolic activities.
- iii. The function of an organism as a whole is the outcome of the activities and interactions of the cells constituting the body of that organism.
- iv. All cells arise from pre-existing cells.
- v. The cells are structural and functional unit of life.
- vi. The growth of an organism occurs by cell division and cellular growth in multicellular organisms while by cellular growth in unicellular organisms.

### **Eukaryotic Cell Structures**

**Cell Wall:** The cell wall is the outermost, rigid, protective and supportive layer found in all the plant cells, bacteria, cyanobacteria, fungi and some protists. It is altogether absent in animal cells. It was first discovered by Robert Hooke in 1665 AD. It is usually made up of three layers: Middle lamella; the outermost layer made up of pectin, Secondary cell wall; the middle layer formed by cellulose & hemicelluloses and Primary cell wall; inner most layers composed by cellulose. It provides mechanical strength, gives shape to plants and prevents undue expansion of cells. It is also involved in many enzymatic activities. The cell wall is present in plant cells however, it is absent in animal cells. The cell wall is present outside the cell membrane (plasma membrane).

**Cell Membrane:** All living cells are externally covered by a thin, transparent, elastic, regenerative and selectively permeable membrane called plasma membrane or plasma lemma. It is the outermost layer of animal cells and layer below cell wall in plant cell. It consists of lipids, proteins, and some carbohydrates. The primary function of the plasma membrane is to control the transportation of molecules in and out of the cells. It shows the phagocytosis (cell eating; intake of large sized solid particles including cellular debris and microbes) and pinocytosis (cell drinking; intake of large sized liquid nutrients) combinedly called as endocytosis. Cell membrane also helps in cellular locomotion (pseudopodial or undulatory movements).

**Cytoplasm:** The amorphous, homogeneous and colloidal ground substance lying between the plasma membrane and nucleus is cytoplasm which consists various inorganic molecules as water, salts, and organic molecules as carbohydrates, lipids, proteins, nucleic acids and variety of enzymes. Cytoplasm provides raw materials to various cell organelles for their functioning and it is the site of biosynthesis of organic bio-molecules on lipids and proteins. It helps in exchange of materials between various cell organelles. It also performs cyclosis which is an active mass movement of

cytoplasm around the cell organelles also called as cytoplasmic streaming. It consist rest of the cell organelles such as nucleus, endoplasmic reticulum, mitochondria, Golgi apparatus, vacuoles, etc, that perform the various functions of the cells.

### **Cell Organelles**

The living sub-cellular structure of the cytoplasm having definite structure and functions are cell organelles which are also known as protoplasmic bodies. And the non living bodies of the cytoplasm are cell inclusions which are formed as a result of metabolism in the cell.

**Mitochondria:** It is the largest cell organelle in animals. It was first discovered by Kolliker (1880 AD) and termed by C. Benda (1898 AD). It is the site for respiration and energy metabolism. Mitochondria are granular or filamentous cytoplasmic structure found outside the nucleus. The mitochondria are composed of a double membrane system. The outer membrane is smooth and completely envelops the organelle. The inner membrane is folded to form cristae which occupy a larger surface area. The internal chamber of mitochondria is referred to as matrix or mitosol.

Mitochondrion is also called as the powerhouse of cell, as they release the energy in the form of ATP during aerobic respiration for the vital activities of cells. It serves as the primary energy source for all cellular functions. The energy created by the mitochondria helps in the growth and division of the cell. Mitochondrion shows the semi autonomous nature due to the presence of self replicating DNA, 70s type of ribosomes and ATP molecules.

**Endoplasmic Reticulum (ER):** Endoplasmic reticulum is a network of membranous system extending from nuclear membrane to cell membrane. It was termed by Porter (1953 AD) and first observed by Garnier (1897 AD). ER is composed of three components; Cisternae, tubules and vesicles. And ER is of two types; Smooth ER (lacks ribosomes) and Rough ER (contains ribosomes scattered on its surface).

Smooth ER helps in the synthesis of steroid hormones and glycogenolysis in liver cells, also involves in synthesis of lipid and ascorbic acid. Rough ER helps in protein synthesis and forms Smooth ER by the loss of ribosomes. The endoplasmic reticulum is also used to transport substances to the various parts of a cell.

**Plastids:** The plastids are the double membrane bounded cytoplasmic organelles of the plant cell and some protozoans as *Euglena*. They develop from small bodies called proplastids. They are absent in bacteria, blue green algae, fungi and animals which contain chromatophores instead of plastids. They may be colorless or colored. Plastids are of three types; Leucoplast (colorless), Chloroplast (green) and Rhodoplast (colored).

Chloroplast is called as 'Kitchen of the cell' because it synthesizes organic food materials during photosynthesis. Chloroplast gives green color for plant and also synthesizes proteins. The term plastid was given by Haeckel (1866 AD).

**Golgi apparatus:** Eukaryotic cells contain a unique cluster of membrane vesicles known as dictyosomes which, in turn, constitute Golgi apparatus (or Golgi complex). It is a set of flattened discs located near the nucleus. The Golgi complex was first discovered by Camillo Golgi (1898 AD). Golgi apparatus consists of three components as cisternae, vacuoles and vesicles. The primary function of the Golgi complex is to store proteins provided by the endoplasmic reticulum and transport them outside the cell to other cells. Golgi apparatus are also involved in the membrane synthesis, particularly for the formation of intracellular organelles (e.g., Peroxisomes, Lysosomes).

**Lysosomes:** Lysosomes are the spherical vesicles enveloped by a single membrane. It was discovered by Christian de Duve in 1955 AD. Lysosomes are regarded as the digestive tract of the cell, since they are actively involved in digestion of cellular substances – namely; proteins, lipids, carbohydrates and nucleic acids. Lysosomal enzymes are categorized as hydrolases. These include the enzymes (with substrate in brackets) –  $\alpha$ -glucosidase (glycogen), cathepsins (proteins), lipases (lipids), ribonucleases (RNA). The lysosomal enzymes are responsible for maintaining the cellular compounds in a dynamic state by their degradation and recycling. Lysosomes digest the intracellular organelles and kill the cells so why they are called as 'Suicidal bags'. Lysosomes also engulf the carcinogens. And DNA of lysosome may cause gene mutations causing the disease like Leukemia (Blood Cancer).

**Ribosomes:** Ribosomes are smallest granular, membraneless cell organelle attached either on rough ER or float freely in the cytoplasm. These are found in both prokaryotic and eukaryotic cells. Ribosomes are made up of r-RNA and protein which are referred as 'protein factory of the cell' and also called Palade particles. The basic type of ribosomes revealed by sedimentation are 70s type ribosome found in prokaryotes as well as in mitochondria and chloroplast of eukaryotic cell having the sub unit 50s & 30s. And 80s type ribosome found in eukaryotes consisting of sub unit 60s and 40s. Ribosome provides the site for the protein synthesis.

**Nucleus:** Nucleus is the most significant component of the cell which directs and controls all the cellular activities and carries the heredity information of the cell. It is the largest cellular organelle, surrounded by a double membrane nuclear envelope. It was first observed by Anton Von Leeuwenhoek and discovered by Robert Brown (1831 AD).



A true nucleus is found in all the eukaryotes except in mature mammalian RBCs, sieve tube of phloem, tracheids and vessels of xylem. The nucleus of the eukaryotic cell contains a dense body known as nucleolus which is rich in RNA (ribosomal RNA). The ground material of the nucleus is often referred to as nucleoplasm (contains chromatophores and nucleolus) which is rich in enzymes such as DNA polymerases and RNA polymerases. The prokaryotes have an incipient nucleus called nucleoid. Nucleus has chromosomes that carry genetic information. Therefore, it has a significant role during cell division. Single cell usually contains one nucleus, while two in paramecium and many in algae and rhizopus.

#### Structure, Composition and Functions of Cell Organelles

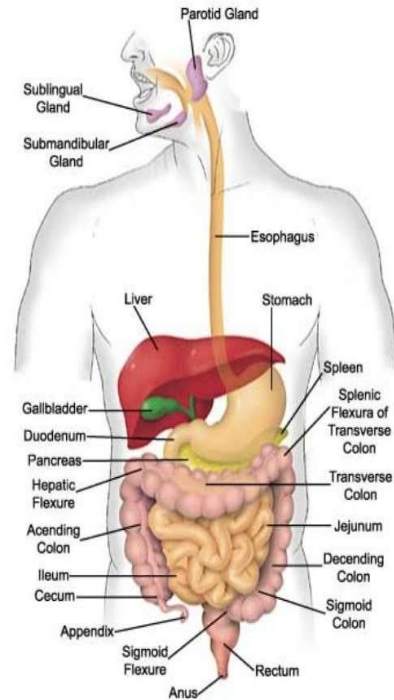
Organelle	Structure	Composition	Function
Cell wall	Rigid layer enclosing the cell membrane	Cellulose fibrils	Support and protection of plant cell & rigidity
Cell membrane	Typical membrane structure enclosing the cell	Bilayer of phospho lipid with embedded proteins	Selective movements of molecules in and out of cell
Nucleus	Round or spherical, centrally located in animal cell and peripherally in plant cell. Nuclear envelop surrounding Nucleoplasm containing chromatin and nucleoli	DNA and Proteins	Division of cell, Inheritance of character, Control of various metabolic activities, Control of growth and reproduction
Nucleolus	Spherical concentrated body in Nucleoplasm	RNA and Proteins	Synthesis of ribosome
Ribosomes	Small round bodies with two sub units	RNA and Proteins	Site of protein synthesis
Endoplasmic Reticulum	Membranous flattened channels and tubular canals	Protein, Lipids, etc.	Transports substances within cell, Forms vacuoles & vesicles
Golgi apparatus	Stacks of membranous sacs	Protein, Lipids, etc	Manufacture of complex polysaccharides,

			packaging of protein secretion, lysosome formation; Maintain turgidity
Vacuoles	Membranous sacs (in plant cell, large in size)	Lipids, proteins, etc	Storage of substances waste, food, water, etc
Lysosomes	Membranous vesicles containing digestive enzymes	Lipids, proteins, etc	Intracellular digestion i.e., Digestion of one cell organelles or product
Mitochondria (Power house of Cell)	Double membraned, inner membrane folded inside to form cristae	Lipids, proteins, etc	Cellular respiration to release and store energy by oxidizing food
Chloroplast	Oval, double membrane; contain granum and stroma in plant cell	Lipids, proteins, etc Chlorophyll pigments	Synthesizes food in plants i.e. performs photosynthesis
Centriole	Two rod like bodies present near nucleus in animal cell	Microtubules with tubulin proteins	Form spindle fibres during cell division, Forms cilia and flagella

## C. The Human Being

The life cycle of a human being goes through four important stages: infancy, childhood, adolescence, and adulthood. Every human being grows from one life stage to the next in repeated pattern generation. Human being develops from a single cell, the tiniest building block of life. After conception, the single fertilized cell, lodged in a woman's womb, multiplies and forms a fetus. The fetus develops due to the rapid multiplications of cells and develops different body parts. This process of development from a single cell to a full term infant takes 40 weeks.

And, the human body is made up of different organs that perform specific functions. Organs that functions together makeup the different body systems of the human body. These organs are made up of tissues which, in turn, are made up of billions of cells.



### Infancy



Infancy is the period that follows the neonatal period and includes the first two years of life. During this time tremendous growth, coordination and mental development occur. An infant is totally dependent upon his or her parents for food, movement, changing clothes, and bathing. Most infants learn to walk, manipulate objects and can form basic words by the end of infancy with a response after he listens. Another characteristic of infancy is the development of deciduous teeth.

## Childhood



Childhood is the age span ranging from infancy to adolescence. A child develops intellectual skills such as reading and writing at this stage. Bones and teeth grow rapidly and temporary teeth are replaced by permanent teeth. Children grow in height and weight and there is a development of body parts and organs. Early childhood follows the infancy stage and begins with toddlerhood when the child begins speaking or taking steps independently. While toddlerhood ends around age three when the child becomes less dependent on parental assistance for basic needs, early childhood continues approximately through years seven or eight. At this stage children are learning through observing, experimenting and communicating with others. Adults supervise and support the development process of the child, which then will lead to the child's autonomy. Also during this stage, a strong emotional bond is created between the child and the care providers. The children also start to begin kindergarten at this age to start their social lives.

Middle childhood begins at around age seven or eight, approximating primary school age. It ends around puberty, which typically marks the beginning of adolescence. In this period, children are attending school, thus developing socially and mentally. They are at a stage where they make new friends and gain new skills, which will enable them to become more independent and enhance their individuality.

## Adolescence



Adolescence is the stage of growth between childhood and adulthood. The World Health Organization defines the age range of 10-19 years as adolescence, 10-14 years as early adolescence, and 15-19 years as less adolescence. A person between early childhood and the teenage years is sometimes referred to as a pre-teen. The body becomes sexually mature at this stage. It involves biological, cognitive, and socio-emotional changes. The time is identified with dramatic changes in the body.

The common changes that take place in boys during this age are increased growth, growth of hair over the body and face, their Adam's apple becomes more prominent, and in girls, their breasts develop, their hips become more prominent, and there is commencement of menarche. Teenagers are prone to acne at this stage.

At this age there is also a greater probability of drug and alcohol use, mental health disorders such as schizophrenia, eating disorders such as anorexia, and clinical depression. The unstable emotions or lack of emotional intelligence among some adolescents may also lead to youth crime. Searching for a unique identity is one of the problems that adolescents often face. Some, but not all, teenagers often challenge the authority or the rules as a way to establish their individuality. They may crave adulthood and be eager to find their place in society. While adolescents are eager to grow up and be treated like adults, they also idolize athletes, movie stars and celebrities.

### Adulthood



Adulthood generally refers to a fully developed and matured person with the end of puberty stage. The body gradually slows the development process during this period. Certain changes such as hair fall and decreasing ability for physical activity are normal at this state. The age at which a person is physiologically an adult is age 17 for females and age 18 for males. Adulthood can also refer to a person's ability to care for them self independently, and raise a family of their own; or it can simply mean reaching a specified age. Graduating high

school, residing in one's own residence and attaining financial independence are all synonymous with adulthood in the United States.

There are some qualities that symbolize adulthood in most cultures. Not always is there a concordance between the qualities and the physical age of the person.

The adult character is comprised of:

- **Self-control** - restraint, emotional control.
- **Stability** - stable personality, strength.
- **Independence** - ability to self-regulate.
- **Seriousness** - ability to deal with life in a serious manner.
- **Responsibility** - accountability, commitment and reliability.
- **Method/Tact** - ability to think ahead and plan for the future, patience.

- **Endurance** - ability and willingness to cope with difficulties that present themselves.
- **Experience** - breadth of mind, understanding.
- **Objectivity** - perspective and realism.

## Human Body Systems

Body systems are an organization of different organ that perform specialized functions. The major body systems include the integumentary system, skeletal system, nervous system, circulatory system, endocrine system, muscular system, respiratory system, excretory system, reproductive system, digestive system, and the immune system.

### Skeletal system

The human skeleton is the internal framework of the body, composed of bones and cartilages. It is composed of 270 bones at birth, this total decreases to 206 bones by adulthood after some bones have fused together. The skeletal system gives shape, provides support to the body and protects vital body organs. It helps in the body's movements. It includes 206 bones and makes up about 18 per cent of body's weight. Bones are strong, yet light and flexible. The Skeletal system is divided into two distinct parts; the axial skeletal system and the appendicular skeletal system. The axial skeleton is the portion of the skeleton that consists of the bones of the head and trunk of a vertebrate. In humans, it consists of 80 bones and can be classified into five regions:

1. Skull (23 bones) – Cranium (8), Face (14) and Hyoid (1).
2. Ear/Auditory ossicles (3 in each ear) (6 bones) – Malleus (2), Incus (2) and Stapes (2).
3. Vertebral Column (26 bones)
4. Sternum (1 bone)
5. Ribs (12 in each) (24 bones)

The appendicular skeleton is composed of 126 bones in the human body. The appendicular skeleton forms during development from cartilage, by the process of endochondral ossification. The appendicular skeleton is divided into six major regions:

1. Pectoral/Shoulder girdles (4 bones) - Left and right Clavicle (2) and Scapula (2).
2. Arms and forearms (6 bones) - Left and right Humerus (2) (Arm), Ulna (2) and Radius (2) (Forearm).

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3. Hands (54 bones) - Left and right Carpals (16) (wrist), Metacarpals (10), proximal Phalanges (10), intermediate Phalanges (8) and distal Phalanges (10).
4. Pelvis (2 bones) - Left and right hip bone (2).
5. Thighs and legs (8 bones) - Left and right Femur (2) (thigh), Patella (2) (knee), Tibia (2) and Fibula (2) (Leg).
6. Feet and ankles (52 bones) - Left and right tarsal (14) (ankle), metatarsals (10), proximal phalanges (10), intermediate phalanges (8) and distal phalanges (10).

The appendicular skeleton of 126 bones and the axial skeleton of 80 bones together form the complete skeleton of 206 bones in the human body.

### **Nervous system**

The nervous system is the chief controlling and coordinating system of the body which controls and regulates all activities of the body and helps the individual to adjust in the given surroundings with voluntary or involuntary actions. This is based on the special properties of sensitivity, conductivity and responsiveness of the nervous system.

In man, it consists of three main parts, the central nervous system (CNS), the peripheral nervous system (PNS) and the autonomic nervous system (ANS). The CNS contains the brain and spinal cord. The PNS is the part of the nervous system that consists of the nerves and ganglia outside of the brain and spinal cord. The main function of the PNS is to connect the CNS to the limbs and organs, essentially serving as a communication relay going back and forth between the brain and the extremities. The ANS regulates the activities of visceral organs by two antagonistic systems; sympathetic nervous system and the parasympathetic nervous system, which regulate involuntary functions, and the enteric nervous system, which functions to control the gastrointestinal system.

The brain has billions of nerve cells to help think, walk, and breathe. The nervous system can react in 1/100 seconds to stimulus. The stimulus is the messenger that sends letters to the part of your body that is experiencing or has experienced danger or surprise. It also sends these signals to your brain, for help to think of other ideas to protect and/or absorb the danger and/or surprise in that area of the body.

### **Circulatory system**

The circulatory system, also called the cardiovascular system, is an organ system that permits blood to circulate and transport nutrients (such as amino acids and electrolytes), oxygen, carbon dioxide, hormones, and blood cells to and from cells in the body to nourish it and help to fight diseases, stabilize body temperature and pH, and to maintain homeostasis.

In man, circulatory system is closed type i.e., blood always remains within the closed vessels. The circulatory system involves heart, veins, capillaries, blood, lymph, etc. Blood is a fluid consisting of plasma, red blood cells, white blood cells, and platelets that is circulated by the heart, carrying oxygen and nutrients to and waste materials away from all body tissues. Lymph is essentially recycled excess blood plasma after it has been filtered from the interstitial fluid (between cells) and returned to the lymphatic system. Heart is the pumping organ, arteries are the vessels to carry blood away from the heart, veins are the vessels to carry blood back to the heart and capillaries are the small vessels to connect the arteries and veins and carry oxygen and nutrients to individual cells.

The circulatory system is often seen to be composed of both the cardiovascular system, which distributes blood, and the lymphatic system, which circulates lymph. These are two separate systems.

**Blood Pressure:** It is the pressure exerted by blood on the wall of the blood vessels (arteries). It is of two kind; Systolic BP: is the pressure exerted by the blood on the wall of blood vessel just at the end of the ventricular systole whose normal value in adult person is 120 mm Hg and Diastolic BP: is the pressure exerted by blood when ventricles are fully relaxed whose value in adult person is 80 mm Hg. Thus, normal value of BP in adult person is 120/80 mm Hg.

**Blood Groups:** In man, blood grouping depends upon the type of antigen (A, B) present in RBCs and antibody (a, b) present in blood plasma. There are four blood groups; A, B, AB and O. The blood group A, B and O were discovered by Karl Landsteiner in 1900 and AB by Decastello and Struli in 1902. The detection of blood groups of both donor and recipient become very essential during transfusion of blood as corresponding antigen and antibody are incompatible.

### **Endocrine system**

The endocrine system refers to the collection of glands of an organism that secrete hormones directly into the circulatory system to be carried towards a distant target organ. It helps to regulate metabolism, growth and development, tissue function, and plays a part also in mood. The field of study dealing with the endocrine system and its disorders is endocrinology, a branch of internal medicine. The major endocrine glands include the pineal gland, pituitary gland, pancreas, ovaries, testes, thyroid gland, parathyroid gland, hypothalamus, gastrointestinal tract and adrenal glands.

The endocrine system is in contrast to the exocrine system, which secretes its chemicals using ducts. The endocrine system is an information signal system like the nervous



system, yet its effects and mechanism are different. The endocrine system's effects are slow to initiate, and prolonged in their response, lasting from a few hours up to weeks. The nervous system sends information very quickly, and responses are generally short lived. Hormones are complex chemicals released from endocrine tissue into the bloodstream where they travel to target tissues and trigger a response. In vertebrates, the hypothalamus is the neural control center for all endocrine systems.

Features of endocrine glands are, in general, they have no ducts, they have a good blood supply, and usually they have vacuoles or granules inside their cells, storing their hormones.

#### Different Hormones of the Human Body

Endocrine Gland	Hormones	Functions
Pituitary	Growth hormone/ Somatotrophic Hormone	Responsible for growth and other activities
		Stimulates formation of bones, cartilages, muscles, cell division, etc
	Adrenocorticotrophic Hormone (ACTH)	Stimulates the growth of adrenal cortex to release cortical hormones
	Thyroid Stimulating Hormone (TSH)	Stimulates the growth of thyroid gland to secrete thyroxine
	Follicle Stimulating Hormone (FSH)	In female, stimulates growth, development and ripening of ovarian follicle.
		In male, stimulates development of sperms.
	Luteinizing Hormone (LH)	Both in male and female stimulate the production of sex hormones.
Prolactin (Lactogenic hormone)	Promotes mammary glands development and milk production	
Thyroid	Thyroxine	Regulates the metabolism and growth of animals
		Increases the rate of consumption of oxygen.
	Calcitonin	Regulates calcium and phosphate level in blood
Parathyroid	Parathormone	Regulates calcium salts in the body
Adrenal	Adrenaline (life	Helps to tackle emergency situation of fear and

(Suprarena l)	adrenaline (fight or flight hormone)	fright, elevates the blood sugar level. Speed up heart beat, breathing and raise the blood pressure.
	Cortisol	Acts as anti-allergic and helps in recovery, increase blood pressure, etc.
Pancreas	Insulin	Regulates the carbohydrate metabolism and uptake
		Lowers blood glucose level.
Gonads: Ovary (female)	Estrogen	Regulates development of female reproductive organs and feminine character viz. voice, skin, etc.
Testes (male)	Testosterone	Regulates development of sexual characters viz. deeper voice, moustache, beard, more body hair, etc.

### Muscular system

The muscular system is an organ system consisting of skeletal, smooth and cardiac muscles. It permits movement of the body, maintains posture, circulates blood throughout the body, provides strength, balance and heat for the body to keep warm. The movement includes opening of the mouth, speaking, shaking hands, walking, talking, or smiling, blinking, and breathing. The largest muscle in the body is the 'gluteus maximus', located in the buttocks. The busiest muscle in the body is the eye muscles.

The muscular system in man is controlled through the nervous system, although some muscles (such as the cardiac muscle) can be completely autonomous. Together with the skeletal system it forms the musculoskeletal system, which is responsible for movement of the human body. About 40 % of the body is occupied by muscles. They are usually attached to the bones.

There are three distinct types of muscles: skeletal muscles, cardiac or heart muscles, and smooth (non-striated) muscles. The skeletal or striated muscles are present in the limbs, body wall, tongue, pharynx and beginning of oesophagus. These are long and cylindrical bounded by sarcolemma. Smooth or non-striated muscles are present in distal part of oesophagus, urogenital tract, urinary bladder, blood vessels, iris of eye and arrector pili muscles of the hair. These are spindle shaped and are bounded by plasmalemma. The cardiac or heart muscles are present in the wall of heart. These are short and cylindrical in shaped, bounded by plasmalemma.

**Respiratory system**

The respiratory system is involved in the intake and exchange of oxygen and carbon dioxide between an organism and the environment. The catabolic process in which living organisms take in oxygen for oxidation of food and release the energy to carry on life activities is respiratory system. During this, CO<sub>2</sub> is released as byproduct. Respiration is of two types; Anaerobic and Aerobic. Anaerobic respiration occurs in absence of oxygen is found in bacteria, yeast, tapeworms, ascaris and even in RBCs and skeletal muscles of higher animals. Aerobic respiration occurs in presence of oxygen is found in most of the plants and animals.

The main functions of respiration are to provide O<sub>2</sub> to the tissues and remove CO<sub>2</sub>. The four major components of respiration are (1) pulmonary ventilation, which means the inflow and outflow of air between the atmosphere and the lung alveoli; (2) diffusion of oxygen and carbon dioxide between the alveoli and the blood; (3) transport of oxygen and carbon dioxide in the blood and body fluids to and from the body's tissue cells; and (4) regulation of ventilation and other facets of respiration.

Mainly, respiration takes place in the respiratory organs called lungs. The passage of air into the lungs to supply the body with oxygen is known as inhalation, and the passage of air out of the lungs to expel carbon dioxide is known as exhalation; this process is collectively called breathing or ventilation. The anatomical features of the respiratory system include trachea, bronchi, bronchioles, lungs, and diaphragm. Molecules of oxygen and carbon dioxide are passively exchanged, by diffusion, between the gaseous external environment and the blood. This exchange process occurs in the alveoli air sacs in the lungs.

**Excretory system**

The excretory system is a passive biological system that removes excess, unnecessary materials from an organism, so as to maintain homeostasis within the organism and prevent damage to the body. It is responsible for the elimination of the waste products of metabolism as well as other liquid and gaseous wastes, as urine and as a component of sweat and exhalation. The metabolic activity produces several kinds of waste products as urea, uric acid, ammonia, creatinine, hippuric acid, etc.

Kidney is the chief excretory organ whereas skin, liver, lungs & intestine are accessory excretory organ in man. And other excretory organs are ureters, urinary bladder, and urethra.

### **Reproductive system**

The reproductive system or genital system is a system of sex organs within an organism which work together for the purpose of sexual reproduction. In other words, reproduction may be defined as the biological process by which organism produce offspring to continue their race on earth. Many non-living substances such as fluids, hormones, and pheromones are also important accessories to the reproductive system. Both the male and female reproductive system is necessary for reproduction.

Male reproductive system is concerned with the production and maturation of sperms and their transfer into the body of females. Male reproductive functions can be divided into three major subdivisions: (1) spermatogenesis, which means the formation of sperm; (2) performance of the male sexual act; and (3) regulation of male reproductive functions by the various hormones. At puberty, the spermatogonia begin to undergo mitotic division and continually proliferate and differentiate through definite stages of development to form sperm. Sperms are produced by germinal epithelium of seminiferous tubules under the regulatory control of FSH and Leydig's Cell. Leydig's cells or interstitial cells of testis synthesize and secrete male sex hormone or androgens like testosterone under the regulatory control of LH. Androgens induce development of secondary sex organs and accessory sexual character and are responsible for the sexual behaviors of the males. The male reproductive organ includes testes, epididymis, vasa deferentia, seminal vesicles, urethra, prostate gland, Cowper's gland and penis.

The female reproductive system is concerned with production, maturation and fertilization of ova, foetal development and child birth. Ovaries, fallopian tubes, uterus, cervix, vagina, vulva, bartholin's gland and mammary gland are the female reproductive organs. Female reproductive functions can be divided into two major phases; (1) preparation of female body for conception and pregnancy (2) the period of pregnancy itself. A developing egg (oocyte) differentiates into a mature egg (ovum) through a series of steps called oogenesis. In contrast to spermatogenesis, which begins in male at puberty, oogenesis begins in females before they are even born. The sex hormones in female include estrogen and progesterone. In the normal non-pregnant female, estrogens are secreted in significant quantities only by the ovaries. Estrogens promote the

development and maintenance of female reproductive structures, secondary sex characteristics, and the breast. And the major function of progesterone is to promote secretory changes in the uterine endometrium during the latter half of the monthly female sexual cycle, thus preparing the uterus for implantation of the fertilized ovum.

### Digestive system

The system of those organs which are associated with the process that converts food into energy is a digestive system. Digestion is the breakdown of food into smaller components which can be more easily absorbed and assimilated by the body. This happens in the gastrointestinal tract. Humans start digesting food from the mouth. Food is chewed by the teeth. Food is swallowed, which means it goes through the oesophagus. It goes into the stomach, where it is mixed with acid. The process of digestion involves six essential steps: ingestion, propulsion, mechanical digestion, chemical digestion, absorption, and defecation (egestion). Digestion is of two kinds: Intracellular and Extracellular. Intracellular digestion occurs in food vacuole within the cell, found in protozoans, poriferans and some coelenterates. Extracellular digestion occurs out of the cell i.e., in alimentary canal is found in higher animals as in human body.

The system involves alimentary canal and digestive glands. The alimentary canal consists of mouth, buccal cavity, pharynx, oesophagus, stomach, intestines, colon, rectum and anus. And the digestive glands include salivary gland, liver, pancreas, gastric gland and intestinal gland. The parts of other organ system such as nerves and blood play an important role in the digestive system. The function of the digestive system is controlled by hormones. These hormones are produced by cells in the mucosa of the stomach and small intestine.

### Different Digestive Enzymes

The enzymes involved in the process of digestion of food in man and their functions;

Name of the Digestive gland	Digestive juice	Site of Digestion	Enzymes secreted	Digested to
Salivary gland	Saliva	Mouth / buccal cavity	Salivary amylase	Glucose
Gastric gland	Gastric juice	Stomach	Pepsin	Peptone and proteose
			Gastric lipase	Smaller fats

	Hydrochloric acid	Stomach		Pepsin/rennin
Liver	Bile salts	Duodenum		Emulsified fats
Pancreas	Pancreatic juice	Duodenum	Trypsin protease	Peptides
			Chymotrypsin	Peptides
			Pancreatic amylase	Glucose, maltose, lactose, sucrose, etc
			Pancreatic lipase	Fatty acid and glycerol
			Carboxy peptidases	Smaller peptides + amino acids
Intestinal gland	Intestinal juice	Small intestine	Erepsin	Amino acid
			Maltase	Glucose
			Lactase	Glucose and galactose
			Sucrase	Glucose and fructose
			Intestinal lipase	Fatty acid and glycerol
			Elastase	Glycine, alanine, valine.

### Immune system

The immune system is a system of biological structures and processes within an organism that protects against disease. The immune mechanisms help an organism identify a pathogen, and neutralize its threat. The system can detect and identify many different kinds of disease agents as like viruses, bacteria and parasites. And also can detect a difference between the body's own healthy cells or tissues and foreign cells. Detecting an unhealthy intruder is complicated, because intruders can evolve and adapt so that the immune system will no longer detect them. Once a foreign cell or protein is detected, the immune system creates antibodies to fight the intruders, and sends special cells 'phagocytes' to eat them up.

The immune system is of two types; innate and adaptive. The adaptive immune system is found in man. The adaptive immune response gives the ability to recognize and remember specific pathogens. The system mounts stronger attacks each time the pathogen is encountered. It is adaptive immunity because the body's immune system prepares itself for future challenges.

## Major Human Body Organs

Organs are a group of tissues that perform different tasks. The human body contains several organs that perform specific functions. The heart is responsible for pumping blood. Several body organs group together to form body systems.

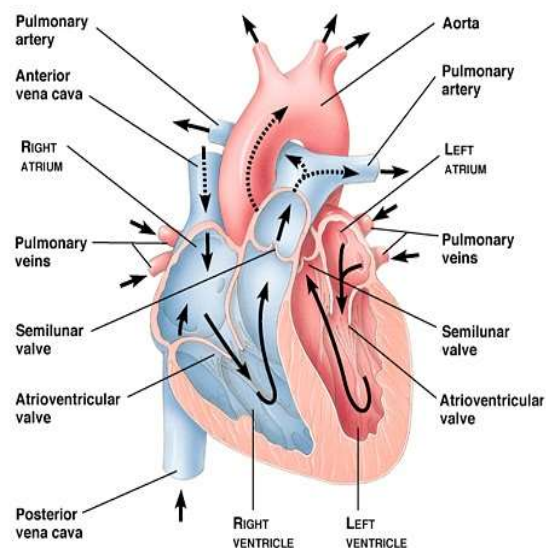
There are many different kinds of organ in the body such as the liver, brain, heart, kidneys, lungs, eyes, tongue, nose, and skin. The skin is the largest organ in the human body.

### Heart

The heart is the large muscular organ that pumps blood throughout the body. It is a major organ of the circulatory system. The heart is a pear-shaped organ about the size of a grape fruit located between the lungs. It works continuously without stopping. It is made of special muscle known as the cardiac muscles which are of three major types; atrial muscle, ventricular muscle and specialized excitatory & conductive muscle fibres. The arteries and veins help the heart in circulating blood throughout the body. The blood supplies oxygen and nutrients to the body. On an average, the heart pumps

about 7,600 liters of blood and beats around 1,00,000 times a day. The heart of an adult weighs from 250 to 300 grams. The heart of a new born baby weighs only 20 gram.

The heart has three layers. The outer covering is the pericardium which surrounds the heart. The middle layer is the myocardium. This is the heart muscle. The inner layer is the endocardium. This is the thin smooth lining of the chambers of the heart. The heart has four chambers, two upper atria, the receiving chambers, and two lower ventricles, the discharging chambers. The atria are connected to the ventricles by the atrioventricular valve and they are separated by the coronary sulcus. The right atrium receives deoxygenated blood from the body and the left atrium receives oxygenated blood from the lungs. When these contract, the blood is pushed into the ventricles, which pump to propel the blood to the lungs and the rest of the body. There is an ear-

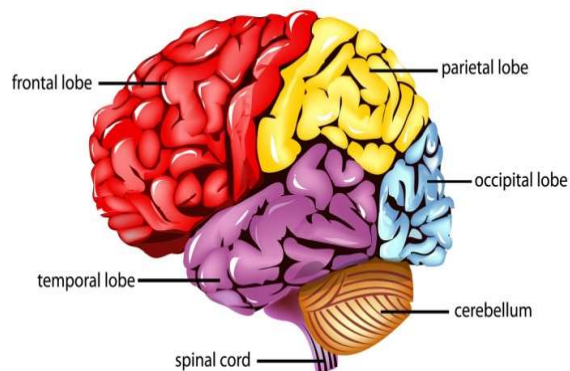


shaped structure in the upper right atrium called the right atrial appendage, or auricle, and another in the upper left atrium, the left atrial appendage. The right atrium and the right ventricle together are sometimes referred to as the right heart. Similarly, the left atrium and the left ventricle together are sometimes referred to as the left heart. These are separated by the posterior interventricular sulcus. The left heart pumps to the systemic circulation and the right heart pumps to the pulmonary circulation.

Blood is carried in blood vessels. These are arteries and veins. Blood going to the heart is carried in veins. Blood going away from the heart is carried in arteries. The main artery going out of the right ventricle is the pulmonary artery (Pulmonary means about lungs). The main artery going out of the left ventricle is the aorta. The veins going into the right atrium are the superior vena cava and inferior vena cava. These bring blood from the body to the right heart. The veins going into the left atrium are the pulmonary veins. These bring blood from the lungs to the left heart.

## Brain

The brain is the highly specialized, soft, whitish and large sized organ situated in cranial cavity of the skull. The primary function of the brain includes muscle control and coordination, sensory reception and integration, speech and emotion. The adult human brain weighs on average about 1500 grams in air, which is only 2 per cent of the body's weight. The human brain is composed of the cerebrum, cerebellum and brainstem.



The human brain has the same general structure as the brains of other mammals, but has a more developed cerebral cortex than any other. The human brain has a basic division into three parts called the forebrain, midbrain, and hindbrain, with interconnected fluid filled ventricles, and a set of generic vertebrate brain structures including the medulla oblongata and pons of the brainstem, the cerebellum, thalamus, hypothalamus, basal ganglia, olfactory bulb, and many others. The forebrain consists of cerebrum and diencephalon. Cerebrum is the major also regarded as most superior part of the brain which includes cerebral hemispheres and basal ganglia. Basal ganglia are the masses of gray matter deep within the white matter of the cerebrum which provide the gross control over skeletal muscle movements.

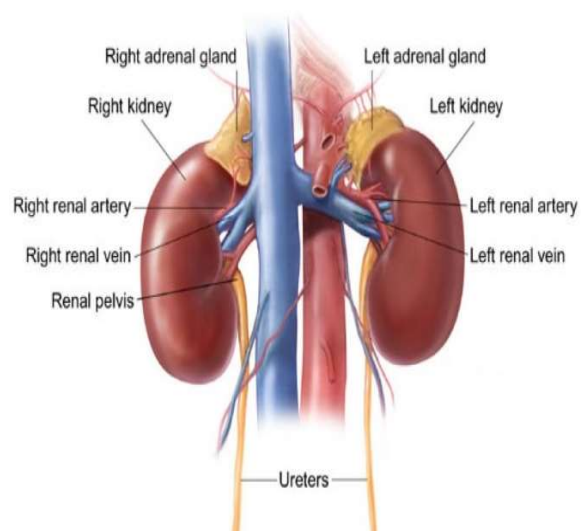


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The human cerebral cortex is a thick layer of neural tissue that covers most of the brain. The cortex is divided into four lobes, called the frontal lobe, parietal lobe, temporal lobe, and occipital lobe. Within each lobe are numerous cortical areas, each associated with a particular function, including vision, motor control, and language. The left and right sides of the cortex are broadly similar in shape. In most people, the left hemisphere is dominant for language, with the right hemisphere playing only a minor role. There are other functions, such as spatiotemporal reasoning, for which the right hemisphere is usually dominant. Diencephalon is divided into four parts; thalamus, hypothalamus, epithalamus and subthalamus. The thalamus is the major sensory relay for many sensory systems. Hypothalamus is the osmoregulatory and thermoregulatory centre referred as 'the master of master endocrine gland' and the link between nervous and endocrine system.

### Kidneys

Kidneys are one pair, bean shaped, and radish brown colored, primary excretory organs of man which is situated in the upper part of abdominal cavity, one on either side of vertebral column. Each adult kidney weighs between 125 and 170 grams in males and between 115 and 155 grams in females. The left kidney is usually slightly larger than the right kidney. The main function of the kidney is to filter the waste out of the blood. The kidney also balances the volume of fluids and minerals in the body. This



process is called homeostasis. Kidneys have the ability to increase their workload. If the body loses one kidney, the other kidney enlarges and does the work of two.

Kidneys are essential in the urinary system and also serve homeostatic functions such as the regulation of electrolytes, maintenance of acid–base balance, and regulation of blood pressure (via maintaining salt and water balance). They serve the body as a natural filter of the blood, and remove water soluble wastes, which are diverted to the urinary bladder. In producing urine, the kidneys excrete wastes such as urea and ammonium, and they are also responsible for the reabsorption of water, glucose,

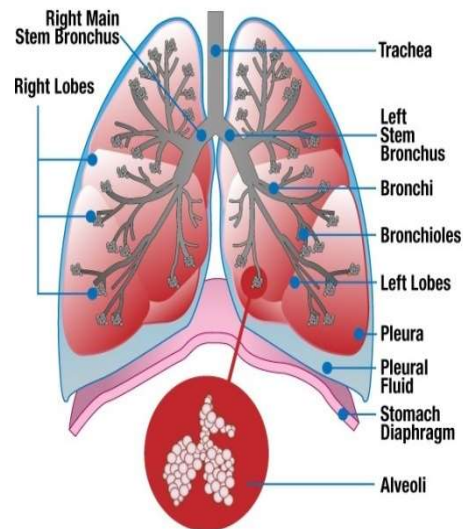
and amino acids. The kidneys also produce hormones including calcitriol, erythropoietin, and the enzyme renin.

## Lungs

The human lungs are the main organs of respiration. Humans have two lungs, a right lung and a left lung. The right lung consists of three lobes while the left lung is slightly smaller consisting of only two lobes (the left lung has a cardiac notch allowing space for the heart within the chest). The primary function of the lungs is exchange of gases.

The lungs are located within the thoracic cavity, on either side of the heart and close to the backbone. They are enclosed and protected by the ribcage. The left lung has a lateral indentation which is shaped to accommodate the position of the heart. The right lobe is a little shorter than the left lung and this is to accommodate the positioning of the liver. Both lungs have broad bases enabling them to rest on the diaphragm. Each lung near to the centre has a recessed region called the hilum which is the entry point for the root of the lung. The bronchi and pulmonary vessels extend from the heart and the trachea to connect each lung by way of the root.

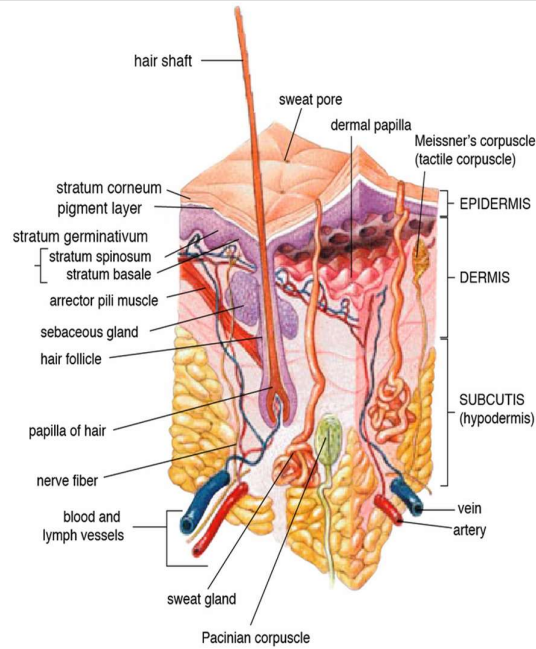
There are three surfaces to the lungs: the costal, mediastinal and diaphragmatic surface. The costal surface is the outer, thoracic surface which is smooth and convex. This surface area is large and corresponds to the form of the thoracic cavity. The mediastinal surface of the lung is in contact with the mediastinal pleura and presents the cardiac impression. The diaphragmatic surface of lung is the portion of the lung which borders on the thoracic diaphragm.



## Skin

The skin is the outer covering of the body. In humans, it is the largest organ of the integumentary system. It is the thinnest in the eyelids and the thickest in the palms and soles. The skin has multiple layers of ectodermal tissue and guards the underlying muscles, bones, ligaments and internal organs. Human skin is similar to that of most other mammals, except that it is not protected by a fur. Though nearly all human skin covered with hair follicles, it can appear hairless. There are two types of skin, hairy and glabrous skin.

Skin plays a key immunity role in protecting the body against pathogens and excessive water loss because it highly interfaces with the environment. Severely damaged skin will try to heal by forming scar tissue. This is often discolored and depigmented. In humans, skin pigmentation varies among populations, and skin type can range from dry to oily. Such skin variety provides a rich and diverse habitat for bacteria, present on the human skin.



### Skin performs the following functions:

1. **Protection:** an anatomical barrier from pathogens and damage between the internal and external environment in bodily defense.
2. **Sensation:** contains a variety of nerve endings that react to heat and cold, touch, pressure, vibration, and tissue injury.
3. **Heat regulation:** the skin contains a blood supply far greater than its requirements which allows precise control of energy loss by radiation, convection and conduction.
4. **Control of evaporation:** the skin provides a relatively dry and semi-impermeable barrier to fluid loss.
5. **Storage and synthesis:** acts as a storage center for lipids and water, as well as a means of synthesis of vitamin D by action of UV on certain parts of the skin.

6. **Excretion:** sweat contains urea; however its concentration is 1/130th that of urine, hence excretion by sweating is at most a secondary function to temperature regulation.
7. **Water resistance:** The skin acts as a water resistant barrier so essential nutrients aren't washed out of the body.

### Amazing Biological Facts

- The human eye blinks an average of about 20,000 times a day and 4,200,000 times a year.
- You will produce 37,800 liters of saliva in your life time.
- You lose about 0.5 liters of water a day through 3,000,000 sweat glands.
- The smallest bone in the human body is the stapes or stirrup bone located in the middle ear. It is approximately 0.11 inch (0.28 cm) long.
- There are 206 bones in the adult human body and there are 270 in children (as they grow some of the bones fuse together).
- It takes approximately 12 hours for food to entirely digest.
- The heaviest human brain ever recorded weighed 5 lb. (2.3 kg).
- Children grow faster in the spring season.
- The average human brain has about 100 billion nerve cells.
- The only joint less bone in your body is the hyoid bone in your throat.
- It takes the interaction of 72 different muscles to produce human speech.
- It is impossible to sneeze with your eyes open.
- Your sneeze can travel at 160 km/hr as fast as a train.
- Babies are born without kneecaps. They don't appear until the child reaches 2-6 years of age.
- There are 10 human body parts that are only 3 letters long (eye, hip, arm, leg, ear, toe, jaw, rib, lip, gum).
- Hair is made from the same substance as fingernails.
- The pancreas produces insulin.
- Every year about 98% of the atoms in your body are replaced.
- The average human heart will beats 3000 million times in its lifetime and pumps 48 million gallons of blood.

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- After spending hours working at a computer display, look at a blank piece of white paper, it will probably appear pink.
- Each square inch (2.5 cm) of human skin consists of 20 feet (6 m) of blood vessels.
- Fingernails grow 4 times faster than toenails.
- Hair grows about 0.5 mm of a day.
- A human being loses an average of 40 to 100 strands of hair in a day.
- After your death, your body starts to dry out creating the illusions that your hair and nails are still growing after death.
- If you go blind in one eye you lose about one fifth of your vision but all you sense of depth.

### Human Body Facts

Length of Alimentary Canal:	Approximately 8 meters
B.M.R (Basal Metabolic Rate):	1600 K. Cal/day.
Number of cells in body:	75 trillion
Longest Bone:	Femur (Thigh bone)
Smallest bone:	Ear ossicle, stapes
Weight of brain:	1400 gms
Blood volume:	5-6 liters (in 70 kg body)
Normal B.P.:	120/80 mm Hg
Life span of R.B.C:	120 days
Life span of W.B.C:	2-5 days
Hb content in body:	500-700 gm
Universal blood donor:	O (Rh-ve)
Universal blood recipient:	AB
Blood clotting time:	2-5 minutes
Average body weight:	70 kg
Normal body temperature:	98.4 <sup>0</sup> F
Breathing rate:	12-16/minutes
Dental formula:	Adult: $\frac{2123}{2123} = 32$ Child: $\frac{2102}{2102} = 20$ (milk teeth)
Number of cranial nerves:	12 pairs
Number of spinal nerves:	31 pairs
Largest endocrine gland:	Thyroid

Emergency gland:	Adrenal Medulla
Gestation period:	9 months+1 week (280 days)
Normal heart beat:	72-75/minute
Largest gland:	Liver
Largest muscle in the body:	Gluteus maximum (Buttock muscle)
Smallest muscle in the body:	Stapedius (ear)
Strongest muscle in the body:	Masseter
Largest artery:	Abdominal aorta
Largest vein:	Inferior venacava
Largest WBC:	Monocyte
Smallest WBC:	Lymphocytes
Greatest regeneration power:	Liver
Minimum regeneration power:	Brain cells
Longest nerve:	Sciatic
Longest cell:	Neuron (nerve cell)
Minimum distance for proper vision:	25 cm
Thinnest skin:	Conjunctiva (eyelid)
pH of Urine:	4.5-8
pH of Blood:	7.35-7.45
pH of Bile:	7.5
pH of Pancreatic juice:	8.5
pH of Gastric juice:	1.4-3
Total number of muscles in the body:	639
Total number of bones in the body:	206
Largest organ of human body:	Skin
Hardest substance in body:	Enamel (secreted by Ameloblast)
The average adult contains about 65% water of his body weight	

## D. Health and Nutrition



Health is a state of complete physical, mental and social well-being. And nutrition may be defined as the science of food and its relationship to health. A balanced diet provides all the food substances needed by the body for healthy growth and development. Proper nutrition, exercise, rest, and sleep are necessary for healthy living.

Nutrition is the study of taking in and utilizing food substances for cell growth, energy, and the ability to fight against infections. Food provides substances that the body needs to build and repair tissues and to regulate organs and systems. These substances are called nutrients. They perform one or more functions. Diseases cause damage to health. Health is affected by several factors such as environment, food, water, and air. Diseases, however, are one of the main causes of damage to our health.

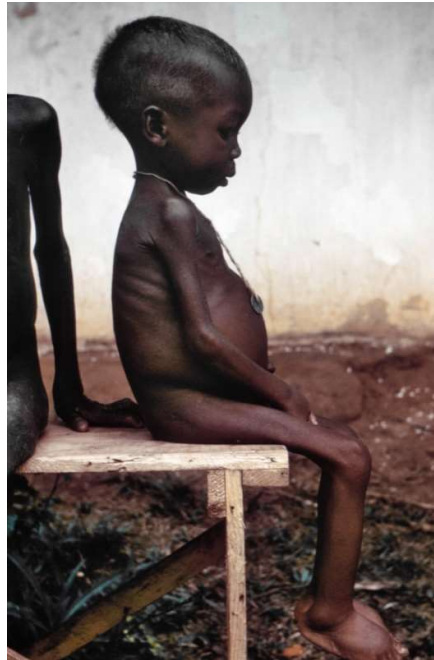
### Source of Nutrients

Nutrients are substances that are required to survive, grow, and stay healthy. They are found in a wide variety of foods, vegetable, milk, meat, and fish. Carbohydrates, protein, fats, vitamins, minerals and water are the six main classes of nutrients that the body needs. It is important to consume these six nutrients on a daily basis to build and maintain healthy bodily function. Carbohydrates are found in cereals, rice, potatoes, fruits, milk etc. Butter, milk, meat and oil are the main sources of fat. Meat, milk, fish, butter, grains, etc., are the common sources of proteins. Different fruit and vegetable,

meat, etc., are the sources of different vitamins and minerals (such as calcium, phosphorus, and iron).

### Malnutrition

Malnutrition is a condition caused due to lack of proper nutrition. It is generally caused due to insufficient, excessive, or unbalanced diet. People are malnourished if they are unable to utilize the food they eat. Malnutrition is also caused if the diet does not provide adequate calories and protein for growth and maintenance. It increases the risk of disease and early death. It may make the body weak and cause health problems such as difficulty in fighting infections and healing. Severe malnutrition may cause problems in the heart, in breathing, and in the kidneys.



Poor nutrition is a chronic problem often linked to poverty, poor nutrition understanding and practices, and deficient sanitation and food security. Malnutrition globally provides many challenges to individuals and societies.

Malnutrition and its consequences are immense contributors to deaths and disabilities worldwide. Promoting good nutrition helps children grow, promotes human development and advances economic growth and eradication of poverty.

### Nutrition and Disease

An improper or inadequate diet can lead to a number of diseases. It is a condition that prevents the body from functioning. Nutrition diseases are caused by imbalanced diet. Many diseases are caused due to the deficiency of certain nutrient is provided to the body. Deficiency diseases are most widespread in developing countries where people often lack access to adequate food supplies. Protein energy malnutrition is caused when the diet is low in both proteins and calories. Vitamin and mineral deficiencies are caused due to missing vitamins or minerals. For example, Vitamin C deficiency, also known as scurvy, causes sore and bleeding gums, painful joints, and slow repair of wounds. The most common mineral deficiency disease is anemia, which is caused due to the lack of iron in the body. The deficiency of iodine causes goiter. The deficiency of different vitamins causes the following diseases:



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Deficiency of vitamin A leads to – Night blindness

Deficiency of vitamin B leads to diseases – Beriberi

Deficiency of vitamin C leads to diseases – Scurvy

Deficiency of vitamin D leads to diseases – Rickets

Deficiency of vitamin E leads to diseases – Sterility

Deficiency of vitamin K – Prevents clotting of Blood

### Good Health

Good health can be maintained by consuming nutritious food and exercising. Nutritious food contains adequate amounts of all the necessary nutrients required for healthy growth and activity. Exercising, walking, and working out are also essential for healthy living. Physical fitness benefits both physical and mental health. Rest and sleep help overcome weakness and restore energy to the body. Cleanliness controls the growth of bacteria and other germs that can cause disease. Regular checkups by a physicians and dentist play an important role in safeguarding health.

### Eating Right

Food plays an important role in keeping us healthy. Quality food eaten in the right amount helps us live a long and healthy life. According to various studies and research, the right foods also prevent and controls disease like diabetes, heart disease, and high blood pressure. Right foods also provide nutrients such as calcium and iron and help us keep our weight under control. The calories we get from food can be balanced by doing physical activities.

### Foods that helps in growth

- Milk with low fat and cholesterol such as skimmed milk
- Low fat milk products such as cheese and yogurt and dishes made with milk like puddings
- Canned fish such as sardines and salmon, poultry without skin, and lean meat
- Dark-green leafy vegetables and deep yellow vegetable
- Citrus fruit or fruit juices, melons, and berries
- Dry beans like red beans and soybeans, lentils, chickpeas, and peanuts
- Whole grains, such as wheat, rice, oats, corn, and barley

### Weight control and Physical activity

Weight control and physical activity is important in preventing various health problems. Too much weight and too little weight are both harmful for the human body. People can control their weight by eating healthy foods and being physically active. According to research, physical activity can help to prevent at least six diseases: heart disease, high blood pressure, obesity (excess weight), diabetes, osteoporosis, and mental disorders, such as depression.

Various Food Components/Chemical Constituents of Life		
COMPOUNDS	SOURCES	FUNCTIONS
CARBOHYDRATES	Rice, wheat, maize, potato, barley, sugarcane. Fish, meat, eggs, milk, etc	Produces instant energy ATP Excess stored as glycogen Basic constituent of protoplasm
PROTEINS	Fish, milk, eggs, meat, gram, pea, soyabean, pulses, etc	Build tissue and help in growth Carries oxygen Helps in blood clotting (Prothrombin & Fibrinogen) Helps to fight with diseases Help in chemical reactions (enzyme)
FATS AND LIPIDS	Animal fat milk, cheese, butter, ghee, egg, meat, fish, Vegetable fat-nuts, sesame, mustard seed, etc	Fuel-yields 9.4 Kcal energy per gm Component of cell organelles and compounds Insulates the nerve fibres electrically Protect and act as shock absorbing pads around visceral organs
MINERAL SALTS: Calcium	Green vegetables, milk, etc	Helps in teeth and bone formation Help in rhythmic action of heart and intestines Help in clotting of blood Help in muscular movement and enzymatic action
Phosphorous	Peas, beans, meat, eggs, fish, milk, etc	Required in teeth and bone formation Helps in formation of ATP Helps in maintaining normal acid-base balance
Sodium	Common salt	Transmission of nerve impulse Maintains normal blood pressure
Potassium	Almost all foods	Regulates nerve transmission Facilitates biochemical reactions Maintains proper fluid balance
Sulphur	Fish, meat, eggs, nuts, cabbage, milk, vegetable, etc	Helps in growth and development of various structures of body i.e. nail, hair

		Helps in neutralizing or eliminating toxins from the body
Iron	Fish, meat, eggs, corn, maize, lentils, peas, etc	Helps in formation of hemoglobin Helps in transportation of oxygen in blood
VITAMINS: Vitamin A	Green leafy vegetables, carrot, cod, liver oil, ghee, etc	Controls normal growth Maintains mucus membrane Increase eye vision
Vitamin B <sub>1</sub>	Milk, sea food, green leafy vegetables, pulses, etc	Helps in carbohydrate metabolism and proper functioning of nervous system
Vitamin B <sub>2</sub>	Milk, peas, beans, yeast, meat, egg, green vegetables, etc	Plays vital role in energy metabolism
Vitamin B <sub>5</sub>	Meat, fish, fowl, potato, tomato, groundnut, etc	Plays important role in citric acid cycle and in fatty acid metabolism
Folic Acid	Green vegetables, sprouted pulses	Manufacture RBC Synthesizes nitrogenous compounds
Vitamin B <sub>12</sub>	Meat, liver, milk, egg yolk, kidney, etc	Helps in formation of RBC Takes part in protein, fat, carbohydrates and nucleic acid metabolism
Vitamin C	Citrus fruits; lemon, orange, guava, tomato, etc	Helps in the formation of collagen that holds the cells together Builds resistance against infection from bacteria
Vitamin D	Fish, liver, oil, butter, milk, egg yolk, etc	Regulates calcium and phosphorous metabolism Helps in normal development of tooth and bones
Vitamin E	Wheat, maize, oil, egg, milk, fish, meat, etc	Plays role in reproduction Maintains fertility
Vitamin K	Cauliflower, cabbage, rice, tomatoes, etc	Necessary for blood coagulation Synthesis of prothrombin
WATER		Major constituent of protoplasm Regulates temperature of the body Helps in transportation of various food particles and excretory products Helps in photosynthesis

## E. Human Diseases

Disease is any change from the normal state that causes discomfort or disability or impairs the health. It is the sickness of the body or the mind which can strike almost any part of the body. It may attack the physical and emotional health of people. Each year, a large number of people die from various diseases. Diseases may either be infectious or non-infectious. Diseases are often prevented by taking precautions. Pathology is the study of disease and etiology is the study of cause of disease. The study of spread of disease and its cause is called epidemiology.

Diseases in the body can be caused by a variety of external and internal factors. The external factors of diseases are bacteria, viruses, parasites, malnutrition, toxins, and radiation from sunlight and radioactive substances. The internal factors include inherited genetic defects, rapid cell growth, blood disorders, immune disorders, and metabolic failures.

### Non Infectious Diseases

Non infectious diseases are mainly caused by the breakdown of tissues and organs. They are also caused by deficiency of nutrients, stress, ageing, and harmful substances. However, they are not caused due to any disease causing organism. They include genetic disease, such as Down's syndrome, hemophilia, and those that are related to lifestyle or the environment, such as arthritis, and cardiovascular disease. Arthritis is a disease that affects the joints. There are more than 100 kinds of arthritis. The most common forms of arthritis are rheumatoid arthritis and osteoarthritis. Rheumatoid arthritis causes pain and swelling in many joints throughout the body. It is the most common among the middle aged adult. Osteoarthritis is basically a disease of older people. Cardiovascular disease is a disease that affects the heart and blood vessels. The primary cause of most cardiovascular disease is a gradual clogging of the arteries that supply blood to the heart, brain and other vital organs.

### Infectious Diseases

Infectious diseases are the most common type of disease. They are caused by germs that invade the body. They can be transmitted by any of a variety of mechanisms, including coughs and sneezes, bites of insects or other carriers of the disease and form contaminated water or food and even by faeces or urine in the sewage. They are caused by microorganisms like bacteria, virus, etc. Diseases causing micro organisms are called pathogens. They damage the cell and tissues and thus produce diseases. Infectious diseases are further grouped into bacterial and viral diseases.

Other infectious diseases are caused by protozoa, fungi and worms. They live in or on the human body. They break the body tissues to obtain their food. Protozoa are single celled organisms. Some of them are parasitic and cause diseases such as malaria. Fungi are also parasitic organisms. Some fungal diseases are athlete's foot and ringworm. They can also cause brain inflammations and a lung disease, called histoplasmosis. Worms like flatworms and roundworms also cause infectious diseases. Flatworms live in the blood, intestines, liver, and lungs. Tapeworms and roundworms live in the intestines. Filariasis and schistosomiasis are two common worm diseases.

### Bacterial Diseases

Bacterial diseases are diseases that are caused by single celled micro organisms called bacteria. They are alive and need to get energy. They enter the human body through various ways such as contaminated food or water and close contact with an infected person. They may emit toxins and waste products into the body. All bacteria do not cause diseases. The bacteria that cause diseases are called pathogenic bacteria. Some of the common bacterial diseases in the body are sinusitis, pneumonia, ear and throat infection and tuberculosis. The immune system of the human body produces antibodies to fight against infections.

### Viral Diseases

Viral diseases are diseases caused by viruses. Viruses are smaller than bacteria. Viruses are non living outside a host cell. They produce only after entering a living cell. They spread from one person to another through contact with bodily fluids such as the cough, sneeze, or vomit of an infected person. They cause many common diseases including chickenpox, rubella, measles, common cold, flu, hepatitis, and mumps. Scientists have identified more than 100 different viruses that cause the common cold. Antiviral drugs and vaccination are used to viral diseases.

### Mental Disorder

A mental disorder or mental illness is a diagnosis of a behavioral or mental pattern that causes either suffering or a poor ability to function in ordinary life. It can be classified of two types: **Psychosis**, a major type of mental illness where a person loses contact with reality; **Neurosis**, a mild type of mental illness where a person realizes his state and agrees to undergo treatment. The major symptoms seen in mental illnesses are

1. **Hallucination**: is an experience involving the false perception of something that is not present. e.g., hearing sounds which do not exist.

2. **Illusion:** is the misinterpretation of real object or feeling. e.g., seeing rope as snake.
3. **Delusion:** is a false belief which cannot be altered with rational argument, e.g., someone is plotting to kill him.

## AIDS

Acquired immune deficiency syndrome is a serious disease caused by a virus called HIV (Human Immunodeficiency Virus). The virus that causes AIDS destroys the immune system's ability to perform properly. A patient suffering from AIDS easily catches certain non-serious diseases. The symptoms of AIDS include lack of energy, weight loss, frequent fevers, extreme headaches, paralysis, and mental deterioration. AIDS is a fatal disease that leads to death.

HIV is transmitted primarily via unprotected sexual intercourse, contaminated blood transfusions, hypodermic needles, and from mother to child during pregnancy, delivery, or breastfeeding. Some bodily fluids, such as saliva and tears, do not transmit HIV. Prevention of HIV infection, primarily through safe sex or the use of contraceptives and needle exchange programs, is a key strategy to control the spread of the disease.

## Causes of Death Worldwide

There are very big differences between the causes of death in developing and in developed countries. In developing countries, many more deaths are caused by the infectious diseases and illnesses spread by insects such as malaria. In developed countries more people become ill from being overweight and eating rich diets. There are about 57 million deaths a year worldwide.

### Top 10 Causes of Death Worldwide

Ischemic Heart Disease:	7.4 million
Stroke:	6.7 million
COPD (Chronic Obstructive Pulmonary Disease):	3.1 million
Lower Respiratory Infections:	3.1 million
Trachea bronchus, Lung cancer:	1.6 million
HIV/AIDs:	1.5 million
Diarrhoeal Disease:	1.5 million
Diabetes:	1.5 million
Road Injury:	1.3 million
Hypertensive Heart Disease:	1.1 million

## F. Questionnaire

1. The term 'Biology' was coined by – Jean Lamarck
2. Biologist who discovered Cell – Robert Hook (1665)
3. Biologist who discovered Nucleus – Robert Brown (1831)
4. Cells which contains maximum protein – Muscle cells
5. Membrane known as skeleton frame work of cells – Endoplasmic reticulum
6. The pigment which gives color to plants – Chromoplast
7. Tissues that transfer food, water and raw materials from roots to the leaves of a plant – Xylem
8. Tissues that transfer manufactured food from leaves of a plant – Phloem
9. Tissues that protect the inner parts of the plants – Epidermal tissue
10. Biologist who introduced the term 'Species' for living beings – John Ray
11. Biologist who introduced the concept of binomial system of nomenclature – Carlous Linneus
12. Branch of biology dealing with identification of organization and providing scientific name – Taxonomy
13. Organisms which are classified as living and dead – Viruses
14. Biologist who discovered Tobacco Mosaic Virus – W.M. Staniey
15. Biologist who divided organism into 5 kingdom – R.H Whittaker
16. Roots that emerge from stem and leaves of plants are known as – Adventitious Plants
17. Stems of banyan tree that grow down ward and penetrate the soil is known as – Proproots
18. New plants developing from the leaves of a plant is known as – Vegetative Propagation
19. Opening in leaves through which gases and water pass in and out of it – Stomata
20. Tissues connecting muscles and bones in animal is known as – Tendons
21. Tissues connecting bone and bones in animal is known as – Ligaments
22. Chemical composition of Bones in Living organisms – Calcium and Phosphorous
23. Blood tissue consists of – Blood cells and plasma
24. What amount of water does plasma contain – 90 % of water
25. Red color of blood is due to the presence of – Hemoglobin
26. Blood cells that protects the body from disease producing organisms – White blood corpuscles (WBC)

27. Blood cell responsible for the clotting of blood after injuries – Blood platelets
28. Virus that attack bacteria is known as – Bacteriophage
29. Natural protein that can be used to destroy virus only enters the host cell – Nucleic Acid
30. During virus infection which substance of virus – Interferons
31. Penicillin used as Anti-Rabies injection is derived from – Fungus
32. Antibiotics produced from Bacteria are – Streptomycin and Aureomycin
33. Streptomycin antibiotic is used for the treatment of – Tuberculosis
34. Aureomycin antibiotic is used for the treatment of – Pneumonia
35. Fungus formed above bread and bakery products is known as – Mycelium
36. Algae responsible for green color of the pond – Euglena
37. Algae which is used as cattle feed – Brown Algae
38. Plants without seeds are known as – Ferns
39. Plants with seeds and fruits are known as – Angiosperm
40. Plants with seed but without fruit is known as – Gymnosperm
41. Moving Unicellular plants are known as – Chlamydomonas
42. Animals without backbone are known as – Invertebrates
43. Animals with backbone are known as – Vertebrates
44. Fish having no bones only cartilage are known as – Shark
45. Living beings existing in both land and water are known as – Amphibians
46. Breathing organ of fish is known as – Gills
47. The number of heart chambers present in a reptiles – Three
48. The only reptile having four chambered heart – Crocodile
49. The only reptile which does not have teeth – Tortoise
50. Human beings to which animal kingdom – Mammalia
51. The organ in stomach that help food to mix with gastric juice for digestion – Peristalsis
52. The organ in human body that stores glycogen to maintain constant blood sugar level – Liver
53. Red blood corpuscle of blood cells originates from – Bone marrow
54. Average life span of blood – 110-120 Days
55. Reduced RBC in blood leads to diseases – Anemia
56. Over production of WBC in blood leads to diseases – Leukemia
57. Hereditary blood diseases occurring only in males – Haemophilia
58. Kidney failure can be temporarily solved through – Dialysis



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59. Normal temperature of human body – 37°C
60. Male reproductive part of plant is known as – Stamens
61. Female reproductive part of plant is known as – Carpel (Pistils)
62. Total number of hormones found in plants – Five
63. At what time plant growth takes place – Night only
64. Branch of biology dealing with study of hereditary – Genetics
65. Biologist who established that chromosomes and genes are the carriers of hereditary material – Walter S. Sutton
66. Total number of chromosomes in human beings – 46 (23 pairs)
67. Harmful chemical found in tea is known as – Thaine
68. Harmful chemical found in coffee is known as – Caffeine
69. Substance known as complete food – Milk
70. Which element is deficient in milk – Iron
71. Carbohydrates in milk is known as – Lactose
72. Chief protein in milk is known as – Casein
73. Mineral essential for the development of teeth bone and clotting of blood – Calcium
74. First disease to be eliminated by vaccination – Small Pox
75. Which system is affected by the bite of cobra snake – Nervous system
76. Which system is affected by the bite of Viper snake – Blood circulatory system
77. Largest part of brain is known as – Cerebrum
78. Pain killers, drugs etc affects which part of the brain – Thalamus
79. Part of brain controlling the movement of muscles in action – Cerebellum
80. Lowest part of brain whose injury can lead to death – Medulla oblongata
81. Gland responsible for tears in eyes – Lachrymal gland
82. Units in eyes which helps in color vision – Cones
83. Units in eyes which helps in black and white vision – Rods
84. Name the eye diseases in which persons can only see distant object – Hyperopia (long sightedness)
85. Eye disease where patient can only see nearby object – Myopia (Short sightedness)
86. Which is the largest flower in the world? – Rafflesia arnoldii
87. Which is the smallest flowering plant? – The Wolffia augusta (commonly called as duckweed or water meal)
88. Name the most nutritive fruit in the world – Avocado (9740 Calories)

89. Name the fruit having least nutrition in the world – Cucumber (73 Calories)
90. Name the plants that stores food in its leaves – Cabbage
91. Name the plant diseases caused by lack of iron in the plants – Chlorosis
92. Name the well known fungi – Mushroom
93. Who discovered antibiotics from Fungi *Penicillium Notatum*? – Alexander Fleming
94. Name the natural dye obtained from Lichen – Litmus (used in chemical test for acidity)
95. Name the bacterium responsible to make milk into curd – The Lacto bacillus
96. Name the bacteria causing Typhoid – Salmonella typhi
97. Name the bacterium that spreads Cholera – Vibrio cholerae
98. Name the biggest cell – The egg of bird ostrich
99. Name the biggest animal – Blue whale
100. Name the tallest living animal – Giraffe
101. Name the biggest land animal – The African bush elephant
102. Name the mammal having no teeth, Known as Ant eater – Pangolin
103. Egg lying mammals are known as – Oviparous Animals
104. Name the mammal that has wins for flying – Bat
105. Animals that gives birth to young one are known as – Viviparous
106. Name the animal that never drinks water – Kangaroo rat
107. Name the animal that has tongue longer than its body? – Chameleon
108. Name the longest living animal – Giant tortoise (182 years)
109. Name the animal having the biggest brain – Sperm whale
110. Name the fastest animal – Cheetah (70 mph)
111. Name the fastest bird – Peregrine Falcon (240 mph)
112. Name the fastest bird on land – Ostrich (45 mph)
113. Name the most intelligent aquatic animal – Dolphin
114. Where do amphibians lay eggs – Water
115. Which living bird is the biggest – Ostrich (upto 156 kg)
116. Name the bird that can fly backward – The hummingbird
117. Which bird is the longest known migrator – The Arctic tern
118. Name the bird that flies under water – Penguin
119. Name the bird that eats stones – The ostrich
120. Name the smallest bird – Bee humming bird
121. Name the bird that does not build its nest – The Cuckoo

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122. Name the bird that lays the smallest egg – The vervain hummingbird
123. Name the breathing organ of amphibians in the world – Skin
124. Name the most poisonous amphibian – Golden frog
125. Which is the largest frog in the world – Goliath frog
126. Which is the biggest Venomous Snake – The King Cobra
127. How many eyes does a spider have – Eight eyes
128. Which parasite is responsible for Malaria diseases? – Plasmodium
129. Which is the shortest living insect? – Mayfly (4 to 5 hrs)
130. Which is the longest living insect? – Queen of termites (50 years)
131. Name the only wing less insect? – Bug
132. A creature with complete metamorphosis – Butterfly
133. Name the insect which has 360° eye vision – Dragonfly
134. Which is the largest butterfly? – Queen Alexander
135. Name the creature having colorless blood – Cockroach
136. Which fishes are called the main eaters? – The Piranhas
137. Which is the fish having three heart – The Cuttle fish
138. Name the fish which can produce 32 different sounds – Dolphin
139. The average weight of a new born child – 2.6 kg
140. When does a new born child first breathe? – When it begins to cry
141. Name the substance that regulate chemical action in the body – The Enzymes
142. Which organ in the body produces the large quantity of Enzymes – Liver
143. Name the chemical that retards heart beat – Acetylcholine
144. What is the normal pulse beat? – (70-72) beats/ minute in men & (78-82) beats/ minute in woman
145. In what form are carbohydrates stored in the liver – Glycogen
146. Name the organ that regulates process of digestion – Bile
147. Name the gland known as master gland – Pituitary gland
148. Name the hormone involved in water regulation of the body – Anti diuretic hormone
149. Name the four main groups of blood – They are A, B, AB and O
150. How much blood do the body have – Average 5 liters of blood

## Geography & Population

### A. Introduction to Geography



Geography in broad sense is the science of earth and human ecology which studies the lands, the features, the inhabitants, and the phenomena of the Earth. A literal translation would be 'to describe or write about the Earth'. The first person to use the word 'geography' was Eratosthenes. We study about the inter relationship between man and his surroundings, and the relationship between earth and the people. Man and earth are both constantly changing. The change is due to the cause and effect between nature and its inhabitants.

Geography has been called "the world discipline" and "the bridge between the human and the physical science". Geography as a discipline can be split broadly into two main branches: the human geography and the physical geography. The former largely focuses on the built environment and how humans create, view, manage, and influence space. The latter examines the natural environment, and how organisms, climate, soil, water, and land forms produce and interact. The difference between these approaches led to a third field, the environmental geography, which combines the physical and the human geography, and looks at the interactions between the environment and humans.

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**The Equator:** The equator is the line which divides the earth into two equal halves. The halves were initially called the northern half and the southern half, but were later named Northern Hemisphere and Southern Hemisphere respectively.

**The Prime Meridian:** The line which divides the earth into two equal spheres (the eastern and western spheres) is called the Prime meridian. It serves as the reference line for the Greenwich Mean Time.

**Latitude:** The imaginary horizontal lines which are drawn parallel to the equator at the intervals of  $15^{\circ}$  are called latitude lines. Latitude is also defined as angular distance of a place north or south of the equator.

**Longitude:** The imaginary vertical lines drawn east or west of the Prime Meridian at the interval of  $15^{\circ}$  are called longitude lines. Longitude is also defined as angular distance east or west of the Prime Meridian.

### Standard Meridian and Greenwich Meridian

A central meridian for determining the standard time of a country is known as the standard meridian. The standard meridian is selected in a manner that is divisible by  $7.5^{\circ}$  so that the standard time differs from GMT by a multiple of half an hour. This uniform time, which followed throughout a particular country, is called the country's standard time. For instance, Nepal's standard time (NST) is 5hr, 45min ahead of GMT, and 15 min ahead of Indian standard time (IST). However, NST is 15 min behind that of Bhutan Standard Time (BST) because Nepal's location is to the west of Bhutan.

The time at Greenwich meridian is known as the Greenwich Mean Time (GMT). Time in other zones is calculated on the basis of the GMT. It is midday (12:00 p.m.) at a place when the sun directly falls on its meridian. The shadow of an object is shortest at this moment of each day.

### International Date Line (IDL)

By the international agreement, the correction of date is made along the  $180^{\circ}$  longitude line. This is called the International Date Line. It passes along the  $180^{\circ}$  longitudes; except inhabited islands in the Pacific Ocean. The  $180^{\circ}$  longitude is diametrically opposite to the Greenwich Meridian Time. It is numbered as  $180^{\circ}$  E and  $180^{\circ}$  W. East of the line is one day or 12 hrs ahead than to the west. The date line is curved east wards and west wards to avoid crossing the land so that time relations in the region would not be complicated.

## B. The Planets

The definition of planet given by the International Astronomical Union (IAU) states that, in the solar system, a planet is a celestial body which:

1. is in orbit around the sun
2. has sufficient mass to assume hydrostatic equilibrium (a nearly round shape), and
3. has cleared the neighborhood around its orbit

Several planets in the solar system can be seen with the naked eyes. Planets are generally divided into two main types: large low density giant planets and smaller rocky terrestrials. Under IAU definition, there are eight planets in the solar system. In order of increasing distance from the sun, they are four terrestrials, Mercury, Venus, Earth and Mars, then four giant planets, Jupiter, Saturn, Uranus, and Neptune. Six of the planets are orbited by one or more natural satellites.

**Mercury:** It is one of the four terrestrial planets in the Solar system and is a rocky body like Earth. It is the smallest planet in the Solar System and the one closest to the Sun with an orbital period of about 88 Earth days, which is much faster than any other planet in the Solar system. Seen from the Earth, it appears to move around its orbit in about 116 days, it has no known natural satellites. It is named after the Roman deity Mercury, the messenger to the gods.

**Venus:** It is the second planet from the Sun, orbiting it every 224.7 Earth days. It has the longest rotation period (243 days) of any planet in the Solar system, and unusually, rotates in the opposite direction to most other planets. It has no natural satellite. It is named after the Roman goddess of love and beauty. After the Moon, it is the brightest natural object in the night sky. It is a terrestrial planet and is sometimes called Earth's 'sister planet' because of their similar size, mass, proximity to the sun and bulk composition.

**Earth:** It is the third planet from the sun, the densest planet in the Solar System, the largest of the Solar System's four terrestrial planets, and the only astronomical object known to harbor life. The earth rotates once in every 24 hours with respect to sun and once every 23 hours, 56 minutes and 4 seconds with respect to the stars. The natural satellite of Earth is Moon

**Mars:** It is fourth planet from the Sun and the second smallest planet in the Solar System after mercury. It is named after the Roman god of war; it is often referred to as the 'Red Planet' because the iron oxide prevalent on its surface gives it a reddish appearance. It is fourth terrestrial planet with a thin atmosphere, having surface features reminiscent both of the impact craters of the Moon and the valleys, deserts, and polar

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ice of Earth. The rotational period and seasonal cycles of Mars are likewise similar to those of Earth, as is the tilt that produces the seasons. Mars has two moons: Phobos and Deimos.

**Jupiter:** It is the fifth planet from the sun and the largest in the Solar System. It is a giant planet with a mass one-thousandth that of the sun, but two and half times that of all the other planets in the Solar System combined. The Romans named it after their god Jupiter. A prominent, Great Red Spot, a giant storm that is known to have existed since at least the 17<sup>th</sup> century when it was first seen by telescope. Jupiter has at least 67 moons, including the four large Galilean moons discovered by Galileo Galilei in 1610. Ganymede, the largest of these, has a diameter greater than that of the planet Mercury.

**Saturn:** It is the sixth planet from the Sun and the second largest in the solar system, after Jupiter. It is also a gas giant with an average radius of about nine times that of Earth. It is named after the Roman god of agriculture. Saturn has a prominent ring system that consists of nine continuous main rings and three discontinuous arcs and that is composed mostly of ice particles with a smaller amount of rocky debris and dust. Saturn orbit has got 62 moons. Titan is the largest moon of Saturn and second largest in the Solar System which is larger than the planet Mercury.

**Uranus:** It is the seventh planet from the sun. It has the third largest planetary radius and fourth largest planetary mass in the Solar System. Uranus is an ice giant whose interior part is mainly composed of ices and rock. Uranus is the only planet whose name is derived from Greek, the Greek god of the sky, Ouranos. Uranus has 27 moons.

**Neptune:** It is the eighth and farthest known planet from the Sun. It is the fourth largest planet by diameter and third largest by mass. Neptune orbits the Sun once in every 168 years. It is 17 times the mass of the Earth and has got 14 moons. Neptune is named after the Roman god of the sea. Neptune is not visible to the unaided eye and is the only planet in the solar system found by mathematical prediction rather than by empirical observation.

### Planets: Facts & Figures

Largest Massive Planet: **Jupiter**

Fastest Sidereal Planet: **Jupiter**; Slowest Sidereal Rotation: **Venus**

Most Moons: **Jupiter** (Planet with Largest Moon); No Moons: **Mercury & Venus**

Greatest Average Density: **Earth**; Lowest Average Density: **Saturn**  
Shortest Day: **Jupiter**; Longest (Synodic) Day: **Mercury**  
Deepest Ocean: **Jupiter**; Tallest Mountain: **Mars**  
Hottest Planet: **Venus**; Coolest Planet: **Neptune**  
Strongest Magnetic Field: **Jupiter**; Fastest Orbiting Planet: **Mercury**  
Most Circular Orbits: **Venus**

### The Earth: Facts & Figures

**Age:** 4.54 billion years  
**Rotation Time:** 23 hours 56 min 4 sec; **Revolution Period:** 365 days 5 hrs 48 min 45 sec  
**Equatorial Diameter:** 12,756 km; **Polar Diameter:** 12,714 km  
**Surface Area:** 510,072,000 Sq. km; **Land Surface:** 29.2%; **Water Surface:** 70.8%  
**Surface Gravity:** 9.807 m/s<sup>2</sup>; **Escape Velocity:** 11.186 km/s  
**Satellite:** 1 (Moon)  
**Largest Desert:** Sahara, N. Africa  
**Longest Mountain Range:** Andes, S. America; **Highest Mountain:** Mt. Everest, Nepal  
**Largest Island:** Greenland  
**Longest River:** Nile (6695 km); **Greatest River:** Amazon, Brazil  
**Greatest Waterfall:** Boyoma, Congo; **Highest Waterfall:** Angel, Venezuela  
**Deepest Valley:** Arun Valley, Nepal  
**Great Lake:** Superior, Canada  
**Longest Glacier:** Lambert fisher, Antarctica  
**Largest Ocean:** Pacific; **Deepest Ocean:** Pacific  
**Largest Sea:** Andaman; **Deepest Sea:** Caribbean  
**Largest Gorge:** Grand Canyon, Colorado River, Arizona; **Deepest:** Hells Canyon, Idaho-Oregon  
**Longest Reef:** Great Barrier Reef, Australia  
**Greatest Tides:** Bay of Fundy, Nova Scotia  
**Most Populated Country:** China; **Least Populated Country:** Vatican City  
**Largest Country:** Russia; **Smallest Country:** Vatican City; **Longest Country:** Chile  
**Most Populous City:** Tokyo  
**Wettest Place:** Mawsynram, Assam (1,187 cm); **Driest:** Atacama Desert, Chile (0.08 cm)  
**Hottest Place:** Dalol, Ethiopia; **Coldest Place:** Plateau station Antarctica  
**Longest Day:** 21<sup>st</sup> June, Northern Hemisphere; **Shortest:** 21<sup>st</sup> December, Northern Hemisphere  
**Longest Night:** 1<sup>st</sup> June, Southern Hemisphere; **Shortest:** 22<sup>nd</sup> December, Southern Hemisphere  
**Total Number of Continents:** 7 (**Smallest:** Australia, **Largest:** Asia)



## C. Seven Continents of the World

### Asia

**Area:** 44,579,000 Sq. Km

**Size:** Largest Continent

**Boundaries;**

East: Pacific Ocean, West: Caspian Sea

North: Arctic Ocean, South: Indian Ocean

**Location:** 10°S to 78°N Lat. and 25°E to 170°E Lon.

**Countries:** 49

**Major Rivers:** Hwang Ho (China), Ganges (India), Yangtze (China), Indus (China), Tigris (Turkey), Brahmaputra (China), Amur (China), Mekong (China), Euphrates (Turkey)

**Major Deserts:** Arabian, Thar, Gobi, Indus Valley Desert

**Major Minerals:** Gold, Coal, Oil, Iron, Magnetite

**Major Cities:** Sanghai, Beijing, Tokyo, Bangkok, Colombo, Delhi, Mumbai, Osaka, Kathmandu



### Africa

**Area:** 30,221,532 Sq. Km

**Size:** Second largest continent

**Boundaries;**

East: Indian Ocean, West: Atlantic Ocean

North: Europe, South: Cape of Good Hope

**Location:** 37°N to 34°S Lat. and 51°E to 17°W Lon.

**Countries:** 54

**Situation:** North and South Hemisphere

**Major Rivers:** Nile, Congo, Nezer, Jambecy

**Major Deserts:** Sahara Desert, Kalahari Desert, Libyan Desert

**Major Minerals:** Gold, Diamond, Pearl, Copper

**Major Cities:** Cairo, Lagos, Johannesburg, Cape Town, Lukas, Nairobi, Harare, Adishababa



### Europe

**Area:** 10,180,000 Sq. Km

**Size:** Sixth Largest Continent

**Boundaries;**

East: Ural Mountain, Ural River; West: Atlantic Ocean; North: Arctic Ocean; South: Mediterranean Sea

**Location:** 71.11<sup>0</sup>N to 36<sup>0</sup> N Lat. and 65<sup>0</sup>E to 9.30<sup>0</sup>W lon.

**Countries:** 50

**Major Rivers:** Volga, Danuba, Rhine, Ural, Oka

**Major Deserts:** Dungeness, Monegros Desert, Oleshky Sands

**Major Minerals:** Iron, Coal, Salt, Silver, Copper, Gold, Lead

**Major Cities:** London, Paris, Berlin, Bern, Moscow, Vienna, Rome, Madrid, Barcelona, Milan, Ruhr, Istanbul



### South America

**Area:** 17,840,000 Sq. Km

**Size:** Forth largest continent

**Boundaries;**

East: Atlantic Ocean West: Pacific Ocean

North: Panama Isthmus South: Caribbean Sea

**Location:** 12<sup>0</sup>N to 56<sup>0</sup>S Lat. and 35<sup>0</sup>W to 81<sup>0</sup>W Lon.

**Countries:** 12

**Major Rivers:** Amazon River, Negro, Japura, Paraguay, Madeira

**Major Deserts:** Atacama Desert, Sechura Desert, Monte Desert

**Major Minerals:** Gold, Silver, Copper, Tin, Diamond

**Major Cities:** Sao Paulo, Rio de Janeiro, Buenos Aires, Salvador, Bogota, Santiago, La Paz, Lima, Caracas, Medellin



### North America

**Area:** 24,709,000 Sq. Km

**Size:** Third Largest Continent of the World

**Boundaries;**

East: The Atlantic Ocean

West: The Pacific Ocean

North: The Arctic Ocean

South: South America

**Location:** 18<sup>0</sup>N to 82<sup>0</sup>N Lat. and 20<sup>0</sup>W to 165<sup>0</sup>W Lon.



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**Countries:** 23

**Major Rivers:** Mississippi River, Missouri River, Yukon, Colorado River, Ohio River

**Major Deserts:** Black Rock Desert, Carcross Desert, Colorado Desert

**Major Cities:** New York, Washington D.C, San Francisco, Chicago, Mexico City, Montreal, Ottawa, Havana, Toronto, Guadalajara

### Australia

**Area:** 7,600,000 Sq. Km

**Size:** Smallest Continent

**Boundaries;**

East: Indian Ocean, Tasman Sea

West: Indian Ocean, South Pacific Ocean

North: Indonesia, North Pacific Ocean

South: New Zealand, South Pacific Ocean

**Location:** 10<sup>o</sup>S to 40<sup>o</sup>S Lat. and 114<sup>o</sup>E to 154<sup>o</sup>E Lon.

**Countries:** 4

**Major Rivers:** Murray Darling, Murrumbidge

**Major Deserts:** Great Victoria Desert, Central Desert, Gibson Desert

**Major Minerals:** Gold, Iron, Coal

**Major Cities:** Sydney, Brisbane, Perth, Melbourne, Hobart, Canberra



### Antarctica

**Area:** 13,720,000 Sq. Km

**Location:** 66<sup>o</sup>S to 90<sup>o</sup>S Lat. and 114<sup>o</sup>E to 153<sup>o</sup>E Lon.

**Situation:** Un-habitated

[\*Note: Lat: Latitude & Lon: Longitude]



### Largest and Smallest Countries of the Continents

Continent	Largest	Smallest
1. Asia	China	Maldives
2. Europe	Russia	Vatican City
3. Africa	Sudan	Seychelles
4. North America	Canada	St. Vincent and Zevice
5. South America	Brazil	Trinidad
6. Australia	Australia	Nauruan

## D. The World at Glance

### Landlocked Countries of the World

1. **Asia:** Azerbaijan, Afghanistan, Armenia, Uzbekistan, Kazakhstan, Kirgizstan, Tajikistan, Turkmenistan, Nepal, Bhutan, Mongolia, Laos
2. **Europe:** Austria, Luxemburg, Hungary, Switzerland, Czech Republic, Vatican City, Lichtenstein, Slovak Republic, Monaco, San Marino, Andorra, Macedonia, Montenegro, Belarus, Moldova
3. **Africa:** Botswana, Burundi, Chad, Malawi, Rwanda, Uganda, Swaziland, Niger, Zimbabwe, Zambia, Mali, Lesotho, Mid African Republic, Burkina-Faso, Ethiopia
4. **South America:** Bolivia, Paraguay

### Geographical Nick Names of Some Countries and Cities

Land of the Rising Sun	- Japan
Land of the Midnight Sun	- Norway
Land of Sunset	- Britain
Land of Snow	- Canada
Land of Kangaroo	- Australia
Seven Mountain City	- Rome
Silver City	- Japura
Garden City	- Chicago
City of Rose	- Japura
Venice of the East	- India
Island of Pearl	- Bahrain
Roof of the World	- Pamir Gath
City of Temple	- Kathmandu
Country of Thunder Bolt	- Bhutan
Country of Cakes	- Scotland
Garden of England	- Kent
Country of Shady Trees	- Canada
Product of Nile River	- Egypt
Sickness of Europe	- Turkey
Island of Clove	- Zanzibar
Play Ground of Europe	- Switzerland
Sorrow of China (Yellow River)-	Hwang Ho

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Sorrow of Bihar	- Koshi River
Sorrow of Bangal	- Damodar River
Country of Elephants	- Laos
City of Motor Cars	- Detroit
Sky Touching City	- New York
Dwarf Country	- Netherland
Cockpit of Europe	- Belgium
City of Palace	- Calcutta
Holy Land	- Jerusalem
Country of Warriors	- Nepal
Land of Peace	- Nepal
Pearl of the East	- Sri Lanka
Dark Continent	- Africa
The Eye of Greece	- Athens

### Changed Names of Some Countries

Old Name	Changed Name
Abyssinia	Ethiopia
Basutoland	Lesotho
Bechuanaland	Botswana
British Honduras	Belize
Burma	Myanmar
Cambodia	Khmer Republic
Cathay	China
Chatham Islands	Sancristobal
Ceylon	Sri Lanka
Congo	Zaire
Dhaomey	Benin
Dutch East Indies	Indonesia
Dutch Guyana	Suriname
East Timor	Lara Sae
Egypt	United Arab Republic (UAR)
Formosa	Taiwan
French West Africa	Mali
Gold Coast	Ghana

Holland	Netherlands
Malaya	Malaysia
Madagascar	Malagasy
Mesopotamia	Iraq
Nyasaland	Malawi
North Borneo	Sahah
Northern Rhodesia	Zambia
Nippon	Japan
Persia	Iran
Republic of Ireland	Eire
Sandwich Islands	Howaiini Slands
Siam	Thailand
Southern Rhodesia	Zimbabwe
South West Africa	Namibia
Trucial Oman	United Arab Emirates (UAE)
Upper Volte	Burkina Faso

### Top 10 Highest Ranges of the World

1. **Himalaya** (Asia): Nepal, India, China, Pakistan, Bhutan; HP: Everest, 8848 m. above the sea level.
2. **Karakoram\*** (Asia): Pakistan, China, India; HP: K2, 8611 m.
3. **Hindu Kush\*** (Asia): Afganistan, Pakistan; HP: Tirich Mir, 7708 m.
4. **Pamirs\*** (Asia): Tajikistan, Kyrgyzstan, China, Afganistan; HP: Kongur Tang, 7649 m.
5. **Hengduan Mountains\*** (Asia): China, Myanmar; HP: Mount Gongga, 7556 m.
6. **Tian Shan** (Asia): China, Kyrgyzstan, Kazakhstan, Uzbekistan; HP: Jengish Chokusu, 7439 m.
7. **Kunlun\*** (Asia): China; HP: Liushi Shan, 7167 m.
8. **Nyenchen Tanglha\*** (Asia): China; HP: Mount Nyenchen Tanglha, 7162 m.
9. **Andes** (South America): Argentina, Chile, Peru, Bolivia, Ecuador, Colombia, Venezuela; H P: Aconcagua, 6962 m.
10. **AlaskaRange** (North America): United States; HP: Denali, 6194 m.

[\*Part of Greater Himalayas; HP: Highest Point]

**Top 10 Highest Peaks of the World**

<b>Mountain</b>	<b>Location</b>
1. Mt. Everest (Sagarmatha)	Nepal
2. Mt. K2 (Godwin Austen)	Pakistan
3. Mt. Kanchenjunga	Nepal
4. Mt. Lhotse	Nepal
5. Mt. Makalu	Nepal
6. Mt. Cho Oyu	Nepal
7. Mt. Dhaulagiri I	Nepal
8. Mt. Manaslu I	Nepal
9. Mt. Nanga Parbat	India
10. Mt. Annapurna I	Nepal

**Top 10 Longest Rivers of the World**

<b>River</b>	<b>Location</b>
1. Nile	Africa
2. Amazon	South America
3. Yangtze (Chang Jiang)	China
4. Mississippi	United States
5. Yenisei	Russia
6. Huang Ho (Yellow River)	China
7. Ob	Russia
8. Parana	South America
9. Zaire (Congo)	Congo
10. Amur	Russia

**Top 10 Largest Lakes of the World**

<b>Lake</b>	<b>Location</b>
1. Caspian	Russia/Iran
2. Superior	US/Canada
3. Victoria	Tanzania/Uganda
4. Huron	U.S./Canada
5. Michigan	U.S
6. Tanganyika	Tanzania/Congo
7. Baikal	Russia
8. Great Bear	Canada
9. Malawi	Tanzania/Malawi
10. Great Slave	Canada

### Top 10 Largest Islands of the World

Names	Situated Area
1. Greenland	North Atlantic
2. New Guinea	South West Pacific, Indonesia
3. Borneo	Indonesia/Malaysia
4. Madagascar	Indian Ocean, Africa
5. Baffin	Canada
6. Sumatra	Indonesia
7. Honshu	Japan
8. Victoria	Arctic Ocean, Canada
9. Great Britain	North West Europe, UK
10. Ellesmere	Canada

### Top 10 Largest Deserts of the World

Names	Location
1. Sahara Desert	N. Africa
2. Arabian Desert	Saudi Arabia
3. Gobi Desert	Mangolia, China
4. Kalahari Desert	Southern Africa
5. Patagonia Desert	Argentina
6. Great Victoria Desert	Australia
7. Great Basin Desert	USA
8. Chihuahuan Desert	Mexico
9. Great Sandy Desert	Australia
10. Kara-Kum Desert	Uzbekistan / Turkmenistan

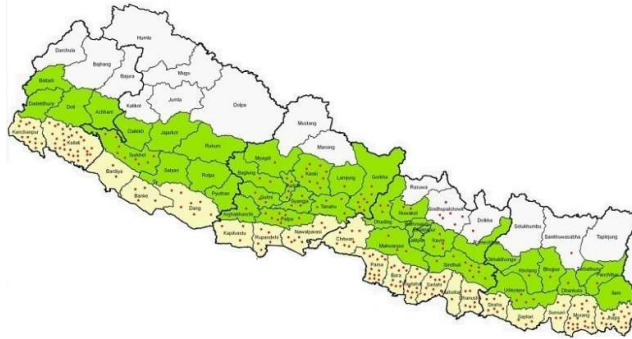
### Top 10 Largest Countries of the World

Names	Area (Sq. Km)
1. Russia	17,098,242
2. Canada	99,84,670
3. China	97,06,961
4. USA	96,29,091
5. Brazil	85,14,877
6. Australia	76,92,024
7. India	31,66,414
8. Argentina	27,80,400
9. Kazakhstan	27,24,900
10. Algeria	23,81,741



## E. Geography of Nepal

Nepal extends between 26022' N to 30027' N latitudes and 8004' E to 88012' E longitudes. Nepal covers an area of 147181 sq km. About 83% of its total area is covered by mountains, hills, valleys and river basins. The altitude of southern plain starts from 61 meters above the sea level and gradually increases



towards the north reaching the world's highest point, Mt. Everest, 8848 meters in the Himalayas. Nepal is landlocked by India on three sides and China's Xizang Autonomous Region (Tibet) to the north. West Bengal's narrow Siliguri Corridor or Chicken's Neck separate Nepal and Bangladesh. To the east are India and Bhutan.

### The Land

Nepal has tremendous geographic diversity. It rises from less than 100 meters elevation in the tropical Terai, beyond the perpetual snow line to some 90 peaks over 7000 meters including Earth's highest 8848 meters Mount Everest or Sagarmatha. From the lowland Terai belt, landforms rise in successive hill and mountain ranges, including the stupendous rampart of the towering Himalayas, ultimately reaching



the Tibetan Plateau beyond the Inner Himalayas. This rise in elevation is punctuated by valleys situated between mountain ranges. Within this maze of mountains, hills, ridges, and low valleys, altitudinal changes results in ecological variation.

Along a south to north transect, Nepal can be divided into three broad physiographic belts: the Mountain Region, the Hill Region, and the Terai Region. All three parallel each other, from east to west as continuous ecological belts, occasionally bisected by the country's river systems. These ecological regions were divided by the government into development sectors within the framework of regional development planning.

### The Terai Region

The Terai or Madhesh region begins at the Indian border and includes the southernmost part of the flat intensively forms the outer Terai. This region starts from about 60 meter upto 610 meters above the sea level with plain topography covering 23% of total land of the country. The altitude of this region decreases gradually from north to south. The Terai covers 20 districts; Jhapa, Morang, Sunsari, Saptari, Siraha, Dhanusha, Mahothari, Sarlahi, Rauthat, Bara, Parsa, Chitwan, Nawalparasi, Rupandehi, Kapilvastu, Dang, Banke, Bardiya, Kailali, Kanchhanpur. The region is also dived into three major sub divisions; Inner terai (Bhitri Madesh), Chure bhabhar and Plain terai. The Tarai includes several valleys (duns), such as the Surkhet and Dang valleys in western Nepal, and the Rapti Valley (Chitwan) in central Nepal.

The word teraimeans 'damp' which appropriately describes the region's humid and hot climate. The region was formed and is fed by three major rivers: the Kosi, the Narayani, and the Karnali. A region that in the past contained malaria-infested, thick forests, commonly known as char kose jhadi (dense forests), the Terai was used as a defensive border by Nepalese rulers during the period of the British Raj (1858-1947) in India. In 1991 the Terai served as the country's granary and land resettlement border; it became the most desirable internal destination for land-hungry hill villagers. In terms of both farm and forest lands, the Terai was becoming Nepal's richest economic region. Overall, Terai residents enjoyed a greater availability of agricultural land than did other Nepalese because of the area's generally flat topography, which is drained and nourished by several rivers. Additionally, it has the largest commercially exploitable forests. However the forest is being increasingly destroyed because of growing demands for human settlement (Urbanization), timber, and agricultural land.

### The Hill Region

The Hill Region or Pahad, situated south of the Mountain Region, is between 700 and 4000 meters in altitude which covers about 41.7% land area of the country. The hill region covers 39 districts; Ilam, Panchthar, Terhathum, Dhankuta, Bhojpur, Khotang, Udayapur, Okhaldhunga, Ramechhap, Sindhuli, Kathmandu, Bhaktapur, Lalitpur, Kabhrepalanchok, Makawanpur, Dhading, Gorkha, Nuwakot, Tanahun, Syangha, Palpa, Aghakhanchi, Gulmi, Parbat, Myagdi, Pyuthan, Baglung, Rukum, Rolpa, Salyan, Jajarkot, Dailekh, Surkhet, Kalikot, Bajura, Achham, Doti, Baitadi, Dadeldhura. This region is also dived into three sub divisions; Mahabharat Lekh, Mid hill and Chure or Siwalik.

It includes the Kathmandu Valley, the country's most fertile and urbanized area. Despite its geographical isolation and limited economic potential, the region always has been

the political and cultural center of Nepal with decision-making power centralized in Kathmandu, the nation's capital. The hill region historically has been the most heavily populated area. Although because of physiographic and climatic difficulties, the higher elevations (above 2500 meters) were sparsely populated but the lower hills and valleys were densely settled. The hill landscape was both a natural and cultural mosaic, shaped by geological forces and human activity. The hills, sculpted by human hands into a massive complex of terraces, were extensively cultivated.

Like the Mountain Region, the Hill Region was a food-deficit area in the early 1990s, although agriculture was the predominant economic activity supplemented by livestock raising, foraging, and seasonal migrating of laborers. The vast majority of the households living in the hills was land hungry and owned largely the pakho (hilly) land. A hill farmer's ability to grow multiple crops was limited. The families were forced to adapt to the marginality as well as the seasonality of their environment. Cultivating their land whenever they could and growing whatever would survive. Dependence on non-agricultural activities was even more necessary in the mountain ecological belt.

### **The Mountain Region**

The Mountain Region or *Himal/Parbat* situated at the northern part of the nation, starts above 4000 meter up to the world's highest point 8848 meter which represents 35.2% of the total land. The Mountain region covers 16 districts; Taplejung, Sankhuwasava, Solukhumbu, Dolakha, Sindhupalchowk, Rasuwa, Lamjung, Kaski, Manang, Mustang, Dolpa, Humla, Jumla, Mugu, Bajhang, Darchula. This region is divided into three sub divisions; the main Himalaya, Inner Himalayas and Marginal Himalayas.

The Mountain Region constitutes the central portion of the Himalayan range originating in the Pamirs, a high altitude region of Central Asia. Its natural landscape includes Mount Everest and the other seven of the world's ten highest peaks. In general, the snow line occurs between 5000 and 5500 meters. The region is characterized by stormy climatic and rugged topographic conditions. The human habitation and economic activities are extremely limited and arduous.

This region is sparsely populated and density is also thin due to the geographical obstacle. The means of livelihood are very limited and there occurs the scarcity of fuel. Animal husbandry, small trade and business are the major sources of economic growth. The famous human settlements of this region are Olangchugola, Namche, Chame and Thak Khola. The dwellers are Sherpa, Thakali, Mugul, Gurung and some others. Due to the cold climate, in winter season, people migrate to the southern parts along with their cattle and again to the north in summer.

## Climate

Nepal has tremendous variation in climate. Its latitude is about the same as that of Florida, and a tropical and subtropical climate exists in the Terai Region. Nepal experiences five seasons: Summer, Monsoon, Autumn, Winter and Spring. The Himalaya blocks cold winds from Central Asia in the winter and forms the northern limit of the monsoon wind patterns. In a land once thickly forested, deforestation is a major problem in all regions, with resulting erosion and degradation of ecosystems. Precipitation generally decreases from east to west with increasing distance from the Bay of Bengal, source of the summer monsoon. Eastern Nepal gets about 2500 mm annually, the Kathmandu area about 1400 mm and western Nepal about 1000 mm. The five climatic zones in Nepal based on altitude are the tropical or subtropical zone of below 1200 m in altitude; temperate zone (1200-2400 m); the cold zone (2400-3600m); the subarctic climatic zone (3600-4400 m); and the arctic zone above 4400 meters in altitude.



The towering Himalayas play a critical role, blocking the northwesterly advances of moist, tropical air from the Bay of Bengal, and ultimately leading to its conversion to rain in the summer. In the winter, this range prevents the outbursts of cold air and ensures warmer winters. In addition, there are seasonal variations in the amount of rainfall, depending on the monsoon cycle. The monsoon cycle is divided into four seasons: pre-monsoon, summer monsoon, post-monsoon, and winter monsoon. The pre-monsoon season generally occurs during April and May; it is characterized by the highest temperatures, reaching 40°C during the day in the Terai Region and other lowlands. The hills and mountains however remain cool.

## Rivers

Nepal can be divided into three major river systems from east to west: the Kosi River, the Narayani River, and the Karnali River. All ultimately become major tributaries of the Ganga River in northern India. After plunging through deep gorges, these rivers deposit their heavy sediments and remains on the plains. Once they reach the Terai region, they often overflow their banks onto wide floodplains during the summer monsoon, periodically shifting their courses. Besides providing fertile alluvial soil, the backbone of the agrarian economy, these rivers present great possibilities for

hydroelectric and irrigation development. None of these river systems however support any significant commercial navigation facility. Rather, the deep gorges formed by the rivers represent immense obstacles to establishing the broad transport and communication networks needed to develop an integrated national economy. As a result, the economy of Nepal has remained fragmented.

The eastern part of the country is drained by the Kosi River, which has seven tributaries. It is locally known as the Sapta Kosi, which means seven Kosi rivers (Tamur, Likhu-Khola, Dudh, Sunn, Indrawati, Tama, and Arun). The principal tributary is the Arun, which rises about 150 kilometers inside the Tibetan Plateau. The Narayani River drains the central part of Nepal and also has seven major tributaries (Daraudi, Seti, Madi, Kali,



Marsyandi, Budhi, and Trisuli). The Kali, which flows between the Dhaulagiri Himal and the Annapurna Himal, is the main river of this drainage system. The river system draining the western part of Nepal is the Karnali. Its three immediate tributaries are the Bheri, Seti, and Karnali rivers, the latter being the major one. The Mahakali, flows along the Nepal-India border on the west side, and the Rapti River also are considered tributaries of the Karnali.

### Forests

Nepal has got different types of forests in different regions. About 25.4% of land area, or about 36360 km<sup>2</sup> is covered with forest according to FAO figures from 2005. About 12.1% Nepal's forest is classified as protected while about 21.4% is conserved. Nepal lost about 2,640 km<sup>2</sup> of forest in between 2000-2005 where the total deforestation rate was about 1.4% per year meaning it lost an average of 530 km<sup>2</sup> of forest annually. Nepal's



total deforestation rate from 1990-2000 was 920 km<sup>2</sup> or 2.1% per year. The 2000-2005 true deforestation rate in Nepal, defined as the loss of primary forest, is 0.4% or 70 km<sup>2</sup> per year. Deforestation is driven by multiple processes. In the hills, forest is converted into agricultural land even on steep hillsides. Degradation is caused by harvesting

firewood, and to a lesser extent wood for traditional architecture. Trees are also severely damaged by intensive harvesting of leaves as fodder, especially in the driest months preceding the summer monsoon. Households typically keep at least one cow or buffalo for milk production, may keep oxen for agricultural labor and in addition goats are herded as the main source of meat.

The slogan 'Hariyo Baan Nepalko Dhan' is popular in the Nepalese society as green forest is the wealth of Nepal. Forest is a very important resource of Nepal which influences climates, causes rain, stops flood, soil erosion and landslide. Forest regulates the temperature of the surrounding areas. It is pleasant to live near forest. Forests also support the agriculture, keeps the soil tight. Forest is the source of all wood-based industries. Forests are rich in herbs which have the medicinal values. Timber and herbs are valuable natural resources. The forest of Nepal is being the habitat for various animals which provide food and shelter to these animals. Animals and birds add the natural beauty of the nation. Many endangered animals are being protected in different National Parks, Wildlife Reserves, and Conservation Area of Nepal. People from many countries visit Nepal to see these beautiful birds and exotic wildlife.

### Minerals

Minerals like slate, stone, rock, coal, iron, copper, limestone, magnetite, mica and natural gas are the natural resources. The lime stones are used in cement industries. Hetauda and Udaypur cement factories are the examples of such industries. Nepal is quite rich in mineral resources. Mineral deposits such as gold, mica, limestone, iron, copper are found in different parts of the country. Because of financial constraint and lack of technical and skilled manpower, mining field is getting back in Nepal. The proper utilization of the mineral resources provides or earns the foreign currencies and creates job opportunities also. The areas where minerals are found in Nepal are as follows:

1. **Copper:** Buddha Khola (Bandipur), Gyari (Gorkha), Arghauli (Chisapani), Taplejung, Ilam, Tama koshi, Baitadi, Myagdi, etc.
2. **Iron:** Ramechhap, Labdhi Khola, Pyuthan, Bhainse, Kulekhani, Bhutkhola, Phulchoki, Ghatkhola, Doti, Myagdi, etc.
3. **Mica:** Bhojpur, Chainpur, Lamjung, Dhankuta, Nuwakot, Sindhuligadhi, etc.
4. **Limestone:** Chobar (Kathmandu), Baise (Makawanpur), Udayapur, Hetauda, Chitwan.
5. **Coal:** Chatara, Chitwan, Saiyan, Dang
6. **Sulphur:** Gosaikund, Chisapani, Barahakshetra
7. **Silver:** Baglung, Chisapani, Fulchoki

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8. **Gold:** Kaligandaki, Budhigandaki, Sunkoshi river sides
9. **Marble:** Godabari and many Places of Mahabharat
10. **Gas:** Mustang, Kathmandu, different places of terai
11. **Tin:** Ganesh Himal, Fulchok
12. **Lead [Glass]:** Galkot, Baitadi
13. **Soda:** Salyan, Doti
14. **Petroleum:** Nepalganj, Dailekha, Pyuthan, Muktinath, Koilabas
15. **Graphite:** Palpa, Sindhupalchok

### Border Crossing of Nepal

Nepal and India have an open border with no restriction on movement of their citizen on either side. There are 22 checkpoints for trade purposes. These are listed in counter clockwise order from east to west.

- 1) Sukhiapokhri, Pashupatinagar
- 2) Naxalbari (Panitanki), Kakarbhitta
- 3) Galgalia, Bhadrapur
- 4) Jogbani, Biratnagar
- 5) Bhimnagar, Setobandha
- 6) Kunauli, Rajbiraj
- 7) Jayanagar, Siraha
- 8) Sursand, Jaleswar
- 9) Sonbarsa, Malangawa
- 10) Bairgania, Gaur
- 11) Raxaul, Birganj
- 12) Nautanwa, Siddharthanagar (Bhairahawa)
- 13) Khunwa, Taulihawa
- 14) Barhni, Krishnanagar
- 15) Jarwa, Koilabas
- 16) Rupaidiha, Nepalgunj
- 17) Katerniyaghat, Rajapur
- 18) Tikonia, Prithivipur (Kailali)
- 19) Gauriphanta, Dhangadhi
- 20) Banbasa, Mahendranagar
- 21) Jhulaghat, Mahakali
- 22) Dharchula, Darchula

## F. Nepal at Glance

<b>Continent</b>	: Asia, Northern hemisphere
<b>Location</b>	: Between the Latitude of 26 <sup>0</sup> 22`N to 30 <sup>0</sup> 27`N and Longitude of 80 <sup>0</sup> 4`E to 88 <sup>0</sup> 12`E
<b>Region</b>	: Southern Asia, Indian subcontinent
<b>Area</b>	: 1, 47,181 sq.km. It covers 0.03% land of the world and 0.3% of Asia.
<b>Length</b>	: 885 km from east to west
<b>Average Width</b>	: 193 km from north to south
<b>Boundaries</b>	: East – India, Sikkim West – India, Kumaon, Uttaranchal, Dehradun North – The autonomous region of china, Tibet South – India, Bihar, Uttar, Pradesh
<b>Shape</b>	: The average length from east Mechi to west Mahakali is 885Km and north to south is 193Km as a land lock country.
<b>Standard Time</b>	: Nepal's standard time has been determined on the basis of 86 <sup>0</sup> 15' East Longitude, which passes through Gaurishankar Himal. It is 5 hour and 45 minutes earlier than Greenwich Mean Time GMT
<b>Altitudinal Range</b>	: <b>(According to District)</b> Higher Himalayan region – 4877 m to 8848 m (35%) Middle Mountain Region – 610 m to 4877 m (42 %) Lower Terai Region – 70 m to 610 m (23%) <b>(According to Geographical Region)</b> Himalayan Region: Area (15%) Mountain Region: Area (68%) Terai Region: Area 17%
<b>Highest point</b>	: Mount Everest – 8848 m.
<b>Lowest point</b>	: Musaharniya, Dhanusa – 59 m.
<b>Literacy Rate</b>	: 65.9%
<b>Federal States</b>	: 7 (unnamed)
<b>Major Religions</b>	: Hindu, Buddhism, Islam, Kirat, Christian, Jain.
<b>Major Languages</b>	: Nepali, Maithili, Bhojpuri, Tharu, Tamang, Newari, Magar, Abadhi, Rai, Kirat, Gurung, Limbu, Urdu, Bhote/Sherpa, Rajbamsi, Hindi, Sunuwar, Thakali.



### Major Mountains

Mt. Everest (8848 m), Kanchenjunga (8586 m), Lhoste (8516 m), Mt. Makalu (8462 m), Mt. Cho Oyu (8201 m), Dhawlagiri (8167 m), Manaslu (8156 m), Annapurna – I (8091 m), Nuptse (7855 m), Ganesh Himal (7429 m), Gaurishankhar (7134 m), Machhapuchhre (6993m)

### Major Rivers

There are about 6000 rivers and rivulates in Nepal.

- **Koshi River** (Eastern), its branch rivers: Arun, Indrawati, Tamor, Dudhkoshi, Sunkoshi, Saptakoshi, Likhu, Tamakoshi.
- **Gandaki River** (Western), its branch rivers- Trisuli, Budi gandaki, Kaligandaki, Myagdi, Marsyangdi, Seti etc.
- **Karnali River** (Mid-western), its branch rivers- Humla-Karnali, Mugu-Karnali, Bheri, Tila, Budiganga Seti, Rapti.
- **Mahakali River** (Far-western) and the major rivers of Middle Hills and Mahabharat Ranges; Kankai, Kamala, Tinau, Babai, Bagmati, Badhganga, Rapti, etc.

### Major Lakes

Rara, (Biggest Lake of Nepal, Mugu), She-Phoksundo (Dolpa), Tilicho (Manang), Phewa (Kaski), Begnastal, Rupatal (Kaski), Gossain -Kunda, Surya–Kunda, Sarawati-Kunda, etc.

### National Parks

Name	Established(AD)	Area(sq.km)
1. Chitwan National Park(Oldest)	1973	932
2. Langtang National Park	1976	1710
3. Sagarmatha National Park	1976	1148
4. Rara National Park(Smallest)	1976	106
5. Shey-Phoksundo National Park(Largest)	1984	3555
6. Khaptad National Park	1984	225
7. Bardiya National Park	1988	968
8. Makalu-Barun National Park	1991	1500
9. Shivapuri National Park	2002	159
10. Banke National Park	2010	550

### Wild Life Reserve

1. Shuklaphanta WLR	1976	305
2. Koshi-Tappu WLR	1976	175
3. Pasra WLR	1984	499

### Hunting Reserve

1. Dhorpatan HR	1987	1325
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### Conservation Area

1. Annapurna CA	1992	7629
2. Kanchanjanga CA	1997	2035
3. Monaslu CA	1998	1663
4. Api Nampa CA	2010	1903
5. Gaurishankar CA	2010	2179
6. Blackbuck CA	2009	15.95

### Protected Wildlife of Nepal

**Mammals** : Arna, Pythan, Red Panda, Kasturi, Krishnasar, Rhino, Chauri Gai, Chari Bagh, Chiru, Hudar, Rabbit, Polar Bear, Habre, Elephant, Yak, Tiger, Barha Singhe

**Aves** : Kalo Saras, Mayor, Danfe, Munal, Seto Saras

**Reptiles** : Phythan, Golden Lizard, Crocodile, Ghadiyal

### Cities

**Capital City** : Kathmandu

**Major Cities** : Kathmandu Valley, Janakpur, Jaleshowr, Tansen, Taulihawa, Damak, Damauli, Dipayal, Dhankuta, Dharan, Dhangadi, Dhulikhel, Narayanghat, Nepalgunj, Patan, Pokhara, Butwal, Banepa, Bhadrapur, Bhairahawa, Mahendranagar, Biratnagar, Birjung, Birendranagar, etc

### Administrative Divisions

**Development Region:** 5

**Zones:** 14

**Districts:** 75

**Metropolitan Municipality:** 1 (Kathmandu)

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**Sub-Metropolitan Municipality:** 11 (Lalitpur, Biratnagar, Pokhara, Birjung, Butwal, Nepalgunj, Janakpur, Hetauda, Itahari, Dharan, Bharatpur)

**Municipality:** 179

**Village Development Committee (VDC):** 3,276

### Universities of Nepal

- i. Tribhuvan University (1959), Kathmandu
- ii. Nepal Sanskrit University (1986), Dang
- iii. Kathmandu University (1991), Bhaktapur, Lalitpur
- iv. Purbanchal University (1993), Biratnagar
- v. Pokhara University (1996), Kaski
- vi. Lumbini Bouddha University (2004), Lumbini
- vii. Agriculture and Forestry University (2010), Chitwan
- viii. Mid-Western University, Birendranagar
- ix. Far Western University (2010), Kanchhanpur

### Transportation in Nepal

The major transportation mediums of Nepal are Roadway, Airway, Ropeway, Waterway, Railway etc.

#### Major Highways

Name	Length (km)	Route
1. Araniko Highway	114	Kathmandu-Kodari
2. B.P Koirala Highway	158	Bardibas-Dhulikhel
3. Mahendra (East-West) Highway	1028	Jhapa-Kanchhanpur
4. Prithvi Highway	174	Naubise-Pokhara
5. Siddhartha Highway	182	Sunauli-Pokhara
6. Tribhuvan Highway	192	Tripureshwor-Birgunj
7. Karnali Highway	220	Surkhet-Jumla
8. Narayanghat-Mugling Highway	36	Narayanghat-Mugling
9. Mechi Highway	268	Bhadrapur-Taplejung
10. Sagarmatha Highway	265	Saptari-Diktel

## Banks of Nepal

**Central Bank of Nepal:** Nepal Rastra Bank

### A Class Commercial Banks of Nepal

Nepal Bank Ltd, Rastriya Banijya Bank Ltd, Agriculture Development Bank Ltd, Nabil Bank Ltd, Nepal Investment Bank Ltd, Standard Chartered Bank Nepal Ltd, Himalayan Bank Ltd, Nepal SBI Bank Ltd, Nepal Bangladesh Bank Ltd, Everest Bank Ltd, Bank of Kathmandu Ltd, Nepal Credit and Commerce Bank Ltd, Lumbini Bank Ltd, NIC Asia Bank Ltd, Machhapuchhre Bank Ltd, Kumari Bank Ltd, Laxmi Bank Ltd, Siddhartha Bank Ltd, Global IME Bank Ltd, Citizens Bank International Ltd, Prime Commercial Bank Ltd, Sunrise Bank Ltd, Grand Bank Nepal Ltd, NMB Bank Ltd (Nepal), Prabhu Bank Ltd, Janata Bank Nepal Ltd, Mega Bank Nepal Ltd, Civil Bank Ltd, Century Commercial Bank Ltd, Sanima Bank Ltd

[\*Ltd: Limited]

## Communication in Nepal

**Radio:** Radio Nepal (2007 B.S, Central and Religion Transmission) Kantipur FM, Annapurna FM, Times FM, Metro FM, Koshi FM, Hits FM, Indreni FM, Radio Sagarmatha, Image FM, Nepal FM, Mero FM, etc.

**Television:** Nepal Television (NTV), NTV PLUS, Kantipur Television, Image Channel, Channel Nepal, ABC TV, Sagarmatha TV, AV News TV, National TV, TV –Filmy, Himalaya TV, Nepal 1, Araniko Television, E24, News 24, etc.

**Telecommunication:** PSTN, GMS, CDMA, VSAT, GMPCS. (NTC, NCELL, UTL, CDMA)

### Newspapers:

- **National Daily:** Gorkhapatra (1901 AD), The Rising Nepal, Kantipur, The Kathmandu Post, The Himalayan Times, Nagarik, Republica, The Annapurna Post, Rajdhani Daily, Karobar Economic Daily
- **Weekly:** The Saptahik Bimarsha, The Tarun, Dristi, Ghatana Ra Bichar, Samakalin, Jana Aastha National Weekly, Budhabar, Chhalphal, Nepali Times, etc.
- **Fortnightly:** Himal, Nepal, etc.
- **Monthly:** AnatarastriyaMunch, Nawayuba, Madhuparka, Mulyankan, Nari, Shickshyak, The twenty first century, Garima, Kamana, Sarbattam, etc.

### Industrial Area

Balaju, Hetauda, Patan, Nepaljung, Dharan, Pokhara, Butwal, Birendranagar, Dhankuta, Rajbiraj, Biratnagar

### Major Airline Companies

Asian Airlines, Everest Air, Karnali Airways, Gorkha Airlines, Tara Air, Manakamana Airways, Nepal Wayu Sewa Nigam, Yeti Airways, Lumbini Airways, Buddha Air, Skyline Airways, Angi Air, Sangrila Air, etc.

### National Heros

1. King Janak 2. Sita 3. Gautam Buddha 4. Amshuverma 5. Araniko 6. Ram Shah 7. Prithivinarayan Shah 8. Bhanubhakta Acharya 9. Bir Balabhardra Kunwar 10. Amarsingh Thapa 11. Bhimsen Thapa 12. Motiram Bhatta 13. King Tribhuvan 14. Shankadhar Sakhwa 15. Pasang Lhamu Sherpa

### National Heritages of Nepal Listed in World Heritages

(1) Hanumandhoka Darbar Square (2) Patan Darbar Square (3) Bhaktapur Darbar Square (4) Pashupatinath Temple (5) Swyambhunath Stupa (6) Changunarayan Temple (7) Bouddhanath Stupa (8) Lumbini (9) Chitwan National Park (10) Sagarmatha National Park

### Major hydropower Project of Nepal

Name	Power (KW)	Location
1. Kaligandaki 'A'	144,000	Syangja
2. Marsyandi	69,000	Tanahun
3. Kule Khani I	60,000	Makawanpur
4. Khimti Khola	60,000	Dholakha
5. Bhote Koshi	36,000	Sindhupalchok
6. Kule Khani II	32,000	Makawanpur
7. Trishuli	24,000	Nuwakot
8. Chilime	20,000	Rasuwa
9. Gandaki	15,000	Nawalparasi
10. Modi Khola	14,800	Parbat
11. Devighat	14,100	Nuwakot
12. Jhimruk	12,300	Pyuthan

## G. Geographical Terminology

**Absolute humidity:** The amount of water vapor present in unit volume of air, usually expressed in grams per cubic meter.

**Adiabatic:** A term applied to the changes taking place in the pressure and temperature of a gas, e.g. air, when heat is neither added to nor taken from it.

**Agronomy:** The branch of agriculture which deals with the scientific cultivation of crops, including such problems as the yield, control of diseases, development of special varieties, etc., and also soil management- conservation, fertility, etc.

**Alpine:** Belonging to the Alps, or, alternatively, to the higher regions of mountain system: applied in reference to the typical climate, relief (glacial features), flora, etc., of the regions(e.g. the Alpine climate).

**Aphelion:** The position of earth in its orbit when it is at its greatest distance from the sun.

**Apogee:** The position in the orbit of the Moon or of any Planet when it is at its greatest distance from the earth.

**Arid:** Deficient in rainfall usually applied to a climate or a region in which the rainfall is barely sufficient to support vegetation, sometimes quite arbitrarily to one in which the average annual rainfall is less than 250 mm.

**Atlas:** A collection of maps bound to its volume.

**Autumn:** The third season of the year following the summer, when crops and fruits are gathered and leaves fall; in the northern hemisphere from September to November and in the southern hemisphere from March to May.

**Avalanche:** A vast mass of snow and ice at high altitude which has accumulated to such an extent that its own weight causes it to slide rapidly down the mountain slope, often carrying with it thousands of tons of rock. An avalanche may thus work immense havoc, destroying villages, roads, forests in its path.

**Axis, Earth's:** The imaginary line, joining the North Pole and the South Pole through the center of the Earth, on which the earth rotates once in every 24 hours. It has an inclination of  $66.5^\circ$  to the earth's orbit.

**Azimuth:** The horizontal angular distance between the vertical plane passing through the observer and the Poles of the Earth and the given object; it may be measured in degrees.

**Bank:** A portion of sea bed rose above its surroundings, but covered with enough water to permit navigation, e.g. the Dogger Bank in the North Sea.

**Bay:** A wide indentation into the land formed by the sea or by the sea or by a lake.

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**Bioclimatology:** The study of climate in relation to life and health, one of its objects being to determine the climate conditions most favorable to human habitation.

**Biogeography:** The study of geographical distribution of plants and animals over the globe, being usually limited to the land surface; it is divided into Phytogeography and Zoogeography.

**Biosphere:** A term sometimes applied to that portion of the Earth poses of classification, to the three main physical zones, the Lithosphere, the Hydrosphere, and the Atmosphere.

**Blood rain:** Rain which is tinted a reddish color, leaving a red stain on the ground. The color is due to the imprisonment, in the drops, of dust particles which have been carried along in the upper air from a desert, often for long distances. It has been most often observed in Italy.

**Bog:** An area of soft, wet, spongy ground, consisting chiefly of decayed or decaying moss and other vegetable matter. It often forms in shallow, stagnant lakes or ponds.

**Bore:** A high tidal wave experienced in a narrow river estuary, advancing upstream like a wall of water; courses along with great force and noise.

**Breakwater:** A barrier built into sea in order to break the force of the waves, and thus to serve as a protection against them.

**Breeze:** A term usually applied to a current of air which is too light to be called a wind, or more specifically to certain types of wind of regular occurrence.

**Bronze Age:** The period when men used implements and weapons made of bronze, an alloy of copper and tin. It does not necessarily denote a fixed chronological period in history, but marks a stage of human culture through which many peoples of the world passed, in their progress from Stone Age to Iron Age.

**Buffer state:** A state situated between two or more powerful states; usually independent, and serving the purpose of helping to prevent war between them. Belgium used to be considered a buffer state between France and Germany.

**Cape:** The point of termination or a neck of land extending into the sea.

**Cartography:** The art of drawing maps and charts.

**Cloudburst:** An abnormally heavy downpour of rain usually associated with a Thunderstorm.

**Colony:** A human settlement formed by a body of people in a territory far from their native land, usually in an undeveloped and sparsely inhabited country; as used in the political sense.

**Coniferous Forest:** A forest of evergreen coniferous or cone-bearing trees, the shape of whose leaves is like a needle.

**Crust, Earth's:** The outermost portion of the earth, about 8-40 km in thickness, and composed largely of Igneous Rocks.

**Dawn:** The faint light which illuminates the various regions of the earth before sunrise; the time when light appears in the sky; the interval during which the atmosphere is illuminated before sunrise.

**Declination:** The angular distance of a heavenly body from the Celestial Equator, measured on a meridian passing through the body.

**Dendrochronology:** The study of past climatic changes as revealed by the annual growth rings of trees, being specially concerned with variations in temperature and rainfall: applied particularly in the field of geochronology.

**Dew point:** The temperature at which the atmosphere, being cooled, becomes saturated with water vapor and by condensation the later is deposited as drops of dew.

**Drizzle:** Rainfall in which the water drops is extremely small, like a fine spray, of diameter about 0.2 to 0.5 mm.

**Drought:** An extended period of dry weather; extreme dryness due to lack rain.

**Eclipse:** They caused on account of the revolution of the earth and the moon; the principle is that light travels in a straight line. When the earth comes in between the sun and the moon, lunar eclipse is caused, whereas we have solar eclipse when the moon comes between the sun and the earth.

**Ecology:** The science which treats of organism in relation to their environment; it is frequently sub divided into human ecology, animal ecology, plant ecology and bio-ecology.

**Ecosystem:** A community of plants and animals, together with their immediate environment, including the inanimate (non-living; not alive) part of that environment.

**Epoch:** A subdivision of a period in the geological scale of time.

**Equator:** The imaginary circle, lying mid way between the poles formed at the surface of the earth by a plane drawn through the centre perpendicular to its axis; as its centre is also the centre of the earth.

**Era:** One of the principle divisions in the geological scale of time being its subdivided into periods.

**Erosion:** A gradual destruction or wearing away of the land by rain, river water, glacier and wind.



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**Flora:** The plant life of a region or of a geological period, corresponding to the term fauna for animal life.

**Fog:** A dense mass of small water drops with smoke or dust particles, in the lower layers of the atmosphere. It is due to cooling of air below its dew point.

**Ford:** A shallow (not very deep) place in a river or stream allowing one to walk or drive across.

**Fossil:** The remains or the form of a plant or animal which has been buried and preserved for a long period in the rock (sedimentary) of the earth crust. It traces the evolutionary changes in animals and the plant life.

**Geochemistry:** The study of the chemistry of the earth including not only the lithosphere, hydrosphere and atmosphere but also the biosphere; it thus links chemistry with geology, meteorology, and biology.

**Geochronology:** The subject that deals with the study of the earth's history in terms of geological scale of time, involving the dating in years of the various geological periods.

**Glacier:** A vast accumulation of ice and snow, which moves slowly down the valley, till it melts and forms a river.

**Gorge:** A narrow passage between the hills formed due to the erosion of hills by rivers.

**Habitat:** The natural environment of a plant or animal, as warm seas, mountain tops, fresh waters, etc.

**Halophytes:** A plant which grows naturally in a salt marsh or other saline environment.

**Hamlet:** A small village or group of houses in a rural area.

**Haze:** A mass of minute solid particles of dust, smoke, liquid drops, etc which obscures the atmosphere near to the earth's surface so as to reduce the visibility.

**Horizon:** The circular line where the sky and the earth, or sea appear to meet.

**Horticulture:** The cultivation of flowers, fruits or vegetables usually on small plots of land, and thus a form of intensive cultivation.

**Humus:** The decomposed or partly decomposed organic matter of animal or vegetable origin (leaves), in the soil.

**Hurricane:** A gale of extreme violence characterized by changes of the wind, and sometimes thunder and lightning.

**Isthmus:** A narrow strip of land connecting two large land masses. e.g., Isthmus of Panama

**Lagoon:** A shallow lake formed at the mouth of a river or near the sea but separated from it by a sand mound.

**Lahar:** A flow of volcanic mud formed by the mixing of water with volcanic ash, sometimes assuming the destructive power of an avalanche.

**Latitude:** It is an angular distance measured north and south of the equator, measured from the center of the earth.

**Leap Year:** A year of 366 days, occurring every fourth year.

**Light Year:** The distance travelled by light in one year. Light travels at the rate of 1,86,000 miles per second. It is a unit for measuring the distance of heavenly bodies.

**Longitude:** It is the angular distance measured east or west of the prime meridian.

**Magma:** The molten material which exists below the solid of the earth's crust, and sometimes reveals itself on its emission from a Volcano.

**Marl:** A mixture of clay and calcium carbonate- though the term is rather loosely applied to a wide variety of rocks and soils.

**Mulatto:** The offspring of white and Negro.

**Nephoscope:** An instrument used to measure the speed and the direction of motion of the clouds; generally; its use is confined to observations on medium and high clouds.

**Nivation:** Erosion due to the action of snow.

**Oasis:** An area in the midst of a desert which is made fertile by the presence of water.

**Orbit:** The path of a heavenly body through space or round the sun; and is slightly elliptical.

**Ozone layer:** That part of the Atmosphere extending from about 10 km (6 miles) to about 50 km above the earth's surface which contains ozone, or the layer where the concentration of ozone is greatest.

**Ozone:** A gas which is an allotropic form of Oxygen, with a rather pungent odor, present in minute amounts in the Atmosphere. Its concentration varies with altitude, reaching a maximum at about 20-25 km.

**Paleontology:** The science which deals with extinct organisms, of either animals or plant origins, whose remains are found buried in the rocks; the study of fossils.

**Peninsula:** The stretch of land almost surrounded by water.

**Plankton:** The minute, floating organisms of plant and animal origin, usually invisible to the naked eye, which inhabit the water of oceans and seas, and form the food of many fishes and other creatures.

**Precipitation:** It is the total amount of water that falls at a particular place, whether in the form of rain or snow or hail.

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**Rainbow:** The colored bow consisting of the colors of the spectrum, seen when sunlight falls on rain, being caused by the reflection and refraction of the rays of the sun in tiny rain droplets suspended in air.

**Rivulet:** A small river.

**Saprophyte:** A plant which lives on decaying organic matter. Most of the saprophytes are fungi.

**Secular:** Extending over a very long period of time.

**Seismology:** The science of the study of Earthquakes.

**Silviculture:** The cultivation of trees and thus a branch of forestry.

**Simoons:** are hot winds that blow from the desert over Arabia and North Africa accompanied with suffocating clouds of sand.

**Taiga:** The coniferous forest land of Siberia, bordered on the north by the treeless, inhospitable Tundra and on the south by the Steppes. The principal species of trees are pine, fir, spruce, and larch.

**Tropics:** The land between the tropic of Cancer and tropic of Capricorn; sometimes known as the Torrid Zone.

**Tsunami:** A large sea waves occasionally experienced along the coasts of Japan and other regions, especially in the Pacific Ocean, caused by the earthquake taking places on the ocean bed.

**Tundra:** The treeless plains of northern N. America and northern Eurasia, lying principally along the Arctic Circle, and on the northern side of the Coniferous forests.

**Twilight:** Light from the sky when the sun is below the horizon either in the morning or evening (before sunrise or after sunset).

**Volcano:** A vent in the earth's crust caused by Magma forcing its way to the surface; molten rock or lava is finally ejected, sometimes with the explosive force, rock fragments and ashes being thrown into the air.

**Xerophyte:** A plant which is adapted to living in a region where little moisture is available i.e, where Drought conditions normally prevail.

**Year:** The period of the time taken for the earth to complete one revolution in its orbit round the sun, or the period taken to complete the cycle of the seasons. It equals 365 days, 5 hours, 48 minutes and 46 seconds and a leap year of 366 days is introduced every fourth year.

**Zenith:** The highest point in the sky directly above our head.

## H. Introduction to Population

A population is a summation of all the organisms of the same group or species, which live in the same geographical area, and have the capability of interbreeding. A city's population is the number of people living in that city. These people are called inhabitants or residents. The population includes all individuals that live in that certain area.

Usually population refers to a collection of human beings in a certain area. Sometimes it is used about animals. Demography is a social science which entails the statistical study of human populations. The maximum population that can be supported in an area is called the carrying capacity.

Population density is the average number of people in a place. Urban areas such as big cities have a high population density. People there live close to each other. In areas with a low population density, people usually live far away from each other, such as in rural areas out in the countryside.

The world population reached seven billion people in 2011. Global population is going up, but the population growth rate is declining all over the world. Urbanization is also common. In population growth births exceed deaths. In the modern world this is due to reduction of infant deaths, control of infectious diseases and modern agriculture.

### Population of Nepal

Nepal is a multicultural and multiethnic country, which was occupied by several small kingdoms in 18<sup>th</sup> century. Nepal is now officially a federal democratic republic nation, which is the world's 93<sup>rd</sup> largest country by area and 41<sup>st</sup> most populous country. The oldest settlements in northern Nepal are Kirants Mongoloid. The mountainous region is sparsely populated above 3,000 m, but in central and western Nepal ethnic Sherpa and Lama People inhabit even higher semi-arid valleys north of the Himalayas. Kathmandu Valley, in the middle hill region, constitutes a small fraction of the nation's area but is the most densely populated, with almost 5 percent of the nation's population. The population of Nepal has been steadily rising recent decades. The current population is roughly 27 million which contributes to an increase of about 3 million people every 5 years.

## I. Major Highlights of National Report (National Population & Housing Census 2011)

There are eleven censuses in Nepal till this date and the census 2011 is the 11<sup>th</sup> census of Nepal. First census was held in 1911 (1968 BS). And the census is carried out in every ten years in Nepal. **Population Day:** 11<sup>th</sup> July; **Census Day:** 22<sup>nd</sup> June, 2011; **Population of Nepal:** 2,64,94,504; Increment of Population in last 10 years: 33,43,081.

### Population and Growth Rate of Nepal 1911-2011

Year	Total Population	Growth Rate
1911	5,638,749	
1920	5,573,788	-0.13
1930	5,532,574	-0.07
1941	6,283,649	1.16
1952	8,256,625	2.28
1961	9,412,996	1.64
1971	11,555,983	2.05
1981	15,022,839	2.62
1991	18,491,097	2.08
2001	23,151,423	2.25
<b>2011</b>	<b>26,494,504</b>	<b>1.35</b>

### Five Most-Populous Districts of Nepal, 2011

District	Population, 2011	Population, 2001	Growth Rate (per annum)
Kathmandu	1,744,240	1,081,845	4.8
Morang	965,370	843,220	1.4
Rupandehi	880,196	708,419	2.2
Jhapa	812,650	688,109	1.7
Kailali	775,709	616,697	2.3

### Five Most-Populous Districts of Nepal, 2011

Caste/Ethnicity	Percent, 2011	Percent, 2001
Chhetree	16.6	15.8
Brahmin	12.2	12.7
Magar	7.1	7.1
Tharu	6.6	6.7
Tamang	5.8	5.6
Newar	5.0	5.5
Kami	4.8	3.9
Musalman	4.4	4.3
Yadhav	4.0	3.9

Rai	2.3	2.8
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#### Ten Most Spoken Mother Tongue of Nepal-2011

Mother Tongue	Percent, 2011	Percent, 2001
Nepali	44.6	48.6
Maithili	11.7	12.3
Bhojpuri	6.0	7.5
Tharu	5.8	5.9
Tamang	5.1	5.2
Newar	3.2	3.6
Bajjika	3.0	1.0
Magar	3.0	3.4
Doteli	3.0	-
Urdu	2.6	0.8

#### Population by Religion, 2011

Religion	Number	Percent
Hindu	21,551,492	81.3
Buddhism	2,396,099	9.0
Islam	1,162,370	4.4
Kirat	807,169	3.0
Christianity	375,699	1.4
Prakriti	121,982	0.5
Bon	13,006	0.0
Jainism	3,214	0.0
Bahai	1,283	0.0
Sikhism	609	0.0
Undefined	61,581	0.2

#### Population Size, Growth and Distribution

Particular	Census, 2011	Census, 2001
Total Population	26,494,504	23,151,423
Male	12,849,041(48.5%)	11,563,921(49.9%)
Female	13,645,463(51.5%)	11,587,502(50.1%)
Sex Ratio	94.2	99.8
Absent Population	1,921,494	762,181
Annual Growth Rate	1.35	2.25
Population Density	180	157

## J. Questionnaire

1. What is the branch of knowledge dealing with the study of relationship between organism and environment known? –Ecology
2. What is the branch of knowledge dealing with study of earth crust? –Geology
3. What is the correct shape of the earth? –Oblate Spheroid
4. What is the shape of the earth's orbit around the sun? –Elliptical Orbit
5. What is the name of the imaginary great circle that divides the earth into two equal hemispheres? – Equator
6. What is the angular distance of a place either north or south of the equator known as? – Latitude
7. What is the latitude of a place situated at equator? –Zero
8. How many hours it will take for the earth to complete one rotation on its axis – 23 hrs 56 min
9. What is the phenomenon responsible for the occurrence of day and night? – Rotation of the earth
10. What is the phenomenon responsible for the occurrence of change of season in the earth? –Revolution of earth around sun
11. At which part of the earth day and night equal throughout the year –The Equator
12. When earth in its orbit is nearer to sun it is known as –Perihelion
13. When earth in its orbit is at far distance from sun it is known as –Aphelion
14. What will be the time difference of two places having a longitudinal difference of  $15^{\circ}$  – 1 hour ( $1^{\circ}=4$  min difference)
15. On which day does northern hemisphere have longer day and shorter nights (Summer Solstice) –June 21
16. On which day does southern hemisphere have longer day and shorter nights (winter solstice) –Dec 22
17. What is the world standard time? –Greenwich mean time (UK)
18. Where is international date line situated –  $180^{\circ}$  E or W meridian of longitude (opposite to Greenwich meridian)
19. By how many hours is Nepali standard time ahead of Greenwich mean time – 5 hrs 45 min
20. What is the name given to the phenomena when nights and day are equal? – Equinox
21. Where does sun shine fall vertically on equinox day? –Equator

22. When is night and day equal on southern hemisphere – September 23
23. When is night and day equal on northern hemisphere – March 21
24. Name the four districts spheres on the surface of the earth – Lithosphere, Hydrosphere, Atmosphere and Biosphere
25. What are the major layers of the atmosphere? – Troposphere, Stratosphere, Mesosphere, Thermosphere and Exosphere
26. At which layer does all the climatic changes occur in the atmosphere – Stratosphere
27. Ozone layer is found in which part of the atmosphere – Mesosphere
28. The region of atmosphere which reflects radio waves back to earth surface to make communication possible – Ionosphere
29. What are the three different kinds of rocks? – Igneous, sedimentary and metamorphic
30. What are the three parts of the earth surface? – Core, Mantle and Crust
31. The most abundant element on earth's crust – Oxygen
32. The most abundant element on earth's atmosphere – Nitrogen
33. The layer in the atmosphere that prevents the damaging UV radiation from reaching the earth – Ozone layer
34. Which of the two continents are just like the mirror images of each other? – South America and Africa
35. The country having the longest land frontier – China
36. What is the maximum duration of a solar eclipse – 7 min 40 sec
37. What phase does moon have during the solar eclipse – New moon
38. The extensive grasslands, known as prairies are found in – North America
39. Around which ocean most of the active volcanoes in the world are found – Pacific Ocean
40. What happens to pressure and temperature with rise of height? – It decreases
41. A strip of land connecting island with main land is called – Isthmus
42. Which canal connects Mediterranean and Red Sea? – Suez Canal
43. Radio carbon dating is used to determine the age of – Fossils
44. What percent of incoming solar radiation is able to reach the earth? – 51%
45. What is the name of the houses of Eskimos known as – Igloo
46. Which is the highest place on the earth? – Mt. Everest, Nepal
47. Where is the lowest point of Earth land surface? – Shores of Dead sea
48. The phenomenon involving bursting of top of mountains is known as – Volcano



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49. Which is the highest active volcano? –Volcano Antofalla, Argentina
50. What is the name for the volcano that does not burst for long but could burst out any time? –Dormant Volcano
51. How many oceans are there in the world and what are they? –Four (The Pacific, The Atlantic, The Indian and The Arctic Ocean)
52. Name the sea where living beings are not available? –Dead Sea
53. What are the two different types of tides? –Spring tide and Neap tide
54. What is the cause of tides? –Gravitational pull of moon
55. What type of tide occur when earth, moon and sun lie in a straight line – Spring tide
56. What type of tide occurs when sun and moon lie at right angle? – Neap tide
57. The sun and eight planets revolving around it is together known as – Solar system
58. Who discovered the Law of planetary motion – John Kepler
59. What is the name of the eclipse when sun, moon and earth are in straight line and moon in the middle? – Solar Eclipse
60. What is the duration of Solar Eclipse? – 7 min 31 second
61. The total number of planets in the solar system? – Eight
62. Which is the coldest planet? – Neptune
63. Which is the fastest revolving planet? – Mercury
64. Which is the fastest rotating planet? – Jupiter
65. Which is the lightest planet? – Mercury
66. Which is the heaviest planet? – Jupiter
67. Which is the brightest planet? – Venus
68. Which is the hottest planet? – Venus
69. Which is the planet popularly known as ‘Morning and Evening Star’? – Venus
70. Which planet has the similar atmosphere to that of Earth? – Mars
71. Name the planet where sun rises in the west and sets on the east? – Venus and Uranus
72. The planet with lowest density? – Saturn
73. Which is the first spacecraft to be launched in the space? – Sputnik I (1957, Russia)
74. Which is the first living being to go to space? – Dog ‘Laika’ (1957)
75. Name the first space craft to land on the moon – Luna 9 (1966)
76. Name the element found on the surface of the moon – Titanium

77. What is the name of the place in moon where Neil Armstrong and Edwin Aldrin landed? – Sea of Tranquility
78. Who discovered the ring of Saturn? – Galileo
79. What is the maximum duration of Lunar Eclipse? – 104 minutes
80. How many seconds it takes for the sun light to reach the earth surface? – 8.3 minutes
81. How many seconds it takes for the moon light to reach the earth surface? – 1.3 seconds
82. Who was the first person to land on the moon? – Neil Armstrong (1969)
83. Name the minor planets that revolve around the sun in between the orbits of Mars and Jupiter? – Asteroids
84. Which continent was found out at last? – Antarctica
85. Which river flows through seven countries? – Dyanub
86. What is the name of the cannel to connect Atlantic Ocean and Pacific Ocean? – Panama Cannel
87. Which is the largest landlocked country according to area? – Mongolia
88. Which is the smallest landlocked country? – Vatican City
89. Who is the first to travel South Pole? – Edmund Hillary
90. Which continent is known as the ‘Continent of Diversity’? – Asia
91. What has separated Europe and Asia? – Eurasia Parwatt
92. Which is only one sea without any creature? – Dead sea
93. Which ocean is known as ocean of monsoon? – Indian Ocean
94. In which river’s bank does the famous city New York lie? – Hudson
95. Which is the city where there is day in half of the part and night in the other half? – Moscow
96. Which continent is known as the ‘Bread Basket of the World’? – Europe
97. Which place of Nepal is famous for Saligrams? – Edge of Kaligandaki
98. Which is the biggest glacier of Nepal? – Lamgtang
99. Which lake lies in the highest altitude of the world? – Tilicho
100. Which is the deepest lake of Nepal? – Shey Phoksundo
101. What is Mt Everest (Sagarmatha) called in Chinese? – Jhomolongma
102. Who named Sagarmatha as third pole? – Mischael Carg
103. Which mountain of Nepal is known as killer mountaion? – Manaslu
104. How many peaks lie in Nepal among World’s Highest 14 Peaks above 8000 meters? – 10

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105. Which Himalayan range is nearest to Kathmandu? – Jugal
106. Which is the temple of Nepal lie in the highest place? – Temple of Muktinath
107. Which is the only one district of terai that has not been touched by Mahendra Highway? – Parsa
108. From whose name was named as Mt. Everest? – Sir George Everest
109. Who were the first persons to climb Mt. Everest? – Tenjing Norge Sherpa and Edmond Hillary
110. Which country does Edmund Hillary belong to? – New Zealand
111. Who were the first women to climb Mt. Everest? – Junko Tawai, Japan (16<sup>th</sup> May, 1965)
112. Which districts are known as the districts beyond mountains? – Manang and Mustang
113. Which district is known as the district of desert? – Mustang
114. How many districts are there in the inner terai of Nepal? – 7
115. Which district of Nepal has touched the highest number of districts? – Sindhuli
116. How many districts of Nepal have touched the border of China? – 13
117. Which districts lies in the central part of Nepal? – Kaski
118. Which district looks like the map of Nepal? – Baglung
119. Which are the zones with equal area? – Koshi and Janakpur (9,669 sq. km)
120. Which place is known as the entrance gate of Nepal? – Birgunj
121. Which place is known as the entrance gate of Mt. Everest? – Namche Bazar, Solukhumbu
122. Which is the biggest manmade lake of Nepal? – Indra Sarowar
123. Which is known as the deepest valley of the world? – Arun
124. Which is the rainiest place of Nepal? – Lumle, Kaski
125. Which is the hottest place of Nepal? – Nepalgunj
126. Which is the longest river of Nepal? – Karnali
127. Which is the biggest river of Nepal? – Koshi
128. Which is the deepest river of Nepal? – Narayani
129. Which is the district headquarters that lies in the tallest place? – Simikot, Humla
130. In which district does Gosaikund lie? – Rasuwa

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## Politics

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Politics is the practice and theory of influencing other people on a civic or individual level. More narrowly, it refers to achieving and exercising positions of governance organized control over a human community, particularly a state. A variety of methods is employed in politics, which include promoting its own political views among people, negotiation with other political subjects, making laws, and exercising force, including warfare against adversaries. Politics is exercised on a wide range of social levels, from clans and tribes of traditional societies, through modern local governments, companies and institutions up to sovereign states, to international level.

A political system is a framework which defines acceptable political methods within a given society. History of political thought can be traced back to early antiquity, with seminal works such as Plato's Republic, Aristotle's Politics and opus of Confucius. Modern political discourse focuses on democracy and the relationship between people and politics. It is thought of as the way we "choose government officials and make decisions about public policy".

## A. The Government

A government can be defined as a term to refer, a public body organizing the political life of the society. Government can also refer to the collective head of the executive branch of power in a polity. The public policies of the government may include; public taxation, defense, education, healthcare, transportation, communication, environment, civil rights, working conditions, etc

### The Purpose of Government

- Form a more perfect union
- Establish justice
- Ensure domestic tranquility
- Provide for the common defense
- Promote the general welfare
- Secure the blessings of liberty

### The Power Organs of the Government

In political systems based on the principle of separation of powers, the authority is distributed among three organs, the major power organs of the government: Legislative, Executive and Judicial. It is an attempt to prevent the concentration of power in the hands of a small group of people. These organs exercise different powers and functions and play a vital role to run a country smoothly.

**Legislative:** A legislature is the law making body of a political unit, usually a national government that has the power to amend and repeal public policy. Laws enacted by the legislatures are known as legislation. Legislature observes and steers the governing actions and usually have exclusive authority to amend the budget. The most common names for the national legislatures are 'Parliament' and 'Congress'. The members of a legislature are called legislators; are generally elected by the people. The other functions of the legislative besides making laws can be; formulation of the laws, controlling the finance, amending the constitution and administrative functions. Under administrative functions, the chief of the executive body is generally appointed from the legislative in parliamentary system. It makes the council of ministers responsible to the legislative.

Legislature consists of a deliberative assembly (gathering of members who use parliamentary procedure to make decisions) in two legislative chambers (or houses): an elected lower house and an upper house (also called Senate) which may be appointed or elected by the lower house. This style of two houses is called bicameral and the legislature with only one house is unicameral. The lower house is almost always the originator of the legislation, and the upper house is the body that offers the second look and decides whether to veto or approve the bills. A veto is the power to unilaterally stop an official action. And a bill is a proposed legislation which doesn't become law until passed by the legislature and approved by executive. Once a bill has been enacted into law, it is called an Act.

**Executive:** The executive is the organ that exercises authority in and holds responsibility for the governance of a state. It is also known as law implementing body of the state or the supreme administrator of the country. The executive executes and enforces the law. The executive does not pass laws (the role of the legislature) or interpret them (the role of the judiciary). Instead, the executive enforces the law as written by the legislature and interpreted by the judiciary. Executive bureaucracies are commonly the source of regulations. The other functions of executive body are administrative, diplomatic, financial and military works.

The Council of Ministers or the government exercises the executive power of a country. And its work is carried out in the name of the government of Nepal. The Prime Minister is appointed on the basis of political consent and the council of ministers is formed under his chairmanship. In a presidential system, the leader of executive is both the head of the state and head of the government. The top leadership roles of the executive body may include;

- **Head of the State: The President**, the chief public representative and living symbol of national unity.
- **Head of the Government: The Prime Minister**, overseeing the administration of all affairs of state.
- **Home Minister**: overseeing the maintenance of internal security and police force.
- **Defense Minister**: overseeing the armed forces, determining military policy and managing external safety.
- **Foreign Minister**: overseeing the diplomatic services, determining foreign policy and managing foreign relations.

- **Finance Minister:** overseeing the treasury, determining fiscal policy and managing national budget.

**Judiciary:** The judicial body (or the Supreme Court) gives equal justice to the people using the existing laws. The legislative formulates, Executive executes and Judicial interprets the law and punishes the law breakers. It is an authentic organ to interpret the constitution and also provides mechanism for the resolution of disputes. It protects the fundamental rights of the people and maintains the rule of law. It also provides suggestions and advises the legislative and the executive in the critical legal matters. Generally, head of the state and head of the government takes advice from the judiciary regarding constitutional and legal problems. According to the constitution, the judicial power of Nepal is exercised by the courts and judicial institutions and there are three types of courts: Supreme Court, Appellate Court and the District Court.

### **Types of Government**

There have been many different types of government around the world throughout the history. Many of the names for them end with –cracy, from a Greek word meaning power.

**Aristocracy:** Rule by a small group of members of a privileged class.

**Autocracy:** Government by one person with unrestricted power; also known as despotism and dictatorship.

**Communist:** Government of a classless state in which private ownership is abolished and the state controls all means of production, as in China and Cuba.

**Democracy:** Government by the people directly or through elected representatives, as in the UK and USA.

**Meritocracy:** Government by leaders selected according to their ability.

**Monarchy:** Government in which power is held by a king (or queen, emperor or empress) who can pass power on to their heirs.

**Oligarchy:** Government by a small group of people.

**Plutocracy:** A government or state in which wealthy people rule.

**Theocracy:** Government ruled by or subject to religious authority.

## B. The Political Philosophy

The political philosophy or political theory is the study of topics such as politics, liberty, justice, property, rights, laws and the enforcement of a legal code by authority: what they are; why they are needed; what, if anything, makes a government illegitimate; what rights and freedoms it should protect and why; what form it should take and why; what the law is; and what duties citizens owe to a legitimate government; and when it may be legitimately overthrown. Political philosophy with a general view or specific ethic often refers to political belief or attitude about politics, synonymous to the term political ideology also considered to be a sub discipline of political science. The **political science** is a social science discipline that deals with systems of government and the analysis of political activity and political behavior. It deals extensively with the theory and practice of politics which is commonly thought of as the determining of the distribution of power and resources. The political philosophy may include;

**Absolutism:** Absolute or despotic monarchy is a monarchical form of government in which the monarch has absolute power over the sovereign state and its people. Absolute monarchies are often hereditary. Absolute monarchy differs from constitutional monarchy, in which a monarch's authority in a constitutional monarchy is legally bounded or restricted by a constitution. Countries where the monarch still maintains absolute power are Brunei, Qatar, Oman, Saudi Arabia, Swaziland, United Arab Emirates and Vatican City.

**Anarchism:** Anarchism is a political philosophy that advocates self governed societies based on voluntary institutions. These are often described as stateless societies. Anarchism holds the state to be undesirable, unnecessary, and harmful. Anarchism does not offer a fixed body of doctrine from a single particular world view, instead fluxing and flowing as a philosophy. Many types and traditions of anarchism exist, not all of which are mutually exclusive. Strains of anarchism have often been divided into the categories of social and individualist anarchism. Anarchism is usually considered a radical left wing ideology, and much of anarchist economics and legal philosophy reflect anti-authoritarian interpretations of communism, collectivism, syndicalism, mutualism or participatory economics.

**Conservatism:** Conservatism as a political and social philosophy promotes retaining traditional social institutions in context of culture and civilization. Some conservatives seek to preserve things as they are, emphasizing stability and continuity, while others,



called reactionaries, oppose modernism and seek a return to 'the way things were'. The term historically associates with right wing politics. There is no single set of policies that are universally regarded as conservative because the meaning of conservatism depends on what is considered traditional in a given place and time. Thus conservatives from different parts of the world, each upholding their respective traditions, may disagree on a wide range of issues.

**Federalism:** The political concept in which a group of members are bound together by contract with a governing representative head. The term federalism is also used to describe a system of the government in which sovereignty is constitutionally divided between a central governing authority and constituent political units (like states or provinces). Federalism is a system based upon democratic rules and institutions in which the power to govern is shared between national and provincial/state governments, creating what is often called a federation. Leading examples of such a political system, or federation, include Switzerland, Germany, the United States, Canada, Australia and India.

**Liberalism:** Liberalism is a political philosophy founded on ideas of liberty and equality. Whereas Classical liberalism and European liberalism prioritize liberty; American liberalism and social liberalism stress equality. Liberals espouse a wide array of views depending on their understanding of these principles, but generally they support ideas and programs such as freedom of speech, freedom of the press, freedom of religion, free markets, civil rights, democratic societies, secular governments and international cooperation. Liberalism rejected the prevailing social and political norms of hereditary privilege, state religion, absolute monarchy, and the Divine Right of Kings. The 17<sup>th</sup> century philosopher John Locke is often credited with founding liberalism as a distinct philosophical tradition. He argued that each man has a natural right of life, liberty and property, while adding that governments must not violate these rights based on the social contract. Liberals opposed traditional conservatism and sought to replace absolutism in government with representative democracy and the rule of law.

**Marxism:** Marxism is a method of socioeconomic analysis, originating from the mid to late 19<sup>th</sup> century of German philosophers Karl Marx and Friedrich Engels; that analyzes class relations and societal conflict using a materialist interpretation of historical development and a dialectical view social transformation. Marxist methodology

originally used economic and sociopolitical inquiry to analyze and evaluate the development of capitalism and the role class struggle in systemic economic change. The eventual long term outcome of the socioeconomic revolution, established the socialism; a socioeconomic system based on social ownership of the means of production, distribution based on ones contribution and production organized directly for use. As the productive forces and technology continued to advance, Marx hypothesized that socialism would eventually give the way to a communist stage of social development, which would be a classless, stateless, humane society erected on common ownership and the principle of 'From each according to his ability, to each according to his needs'.

**Nationalism:** Nationalism is a shared group feeling in the significance of a geographical and sometimes demographic region seeking independence for its culture and ethnicity that holds that group together. This can be expressed as a belief or political ideology that involves an individual identifying with or becoming attached to one's nation. Nationalism involves national identity, by contrast with the related concept of patriotism, which involves the social conditioning and personal behaviors that support a state's decisions and actions. From a political or sociological perspective, there are two main perspectives on the origins and basis of nationalism. One is the primordial perspective that describes nationalism as a reflection of the ancient and perceived evolutionary tendency of humans to organize into distinct groupings based on an affinity of birth. The other is the modernist perspective that describes nationalism as a recent phenomenon that requires the structural conditions of modern society in order to exist. National flags, national anthems and other symbols of national identity are commonly considered highly important symbols of the national community.

**Socialism:** Socialism is a range of economic and social systems characterized by social ownership and democratic control of the means of production; as well as the political ideologies, theories, and movements that aim at their establishment. Social ownership may refer to forms of public, cooperative, or collective ownership; to citizen ownership of equality; or to any combination of these. Although there are many varieties of socialism and there is no single definition encapsulating all of them, social ownership is the common element shared by its various forms.

## C. Constitution

**Constitution is the legal document that carries the power and structures of state, systems and ways to govern the nation. It is the supreme law of a country. The countries Laws, Acts, Rules, Regulations and by laws are based on the constitution. A constitution provides the power sharing for the chief organs of the government; the executive, the legislative and the judiciary and its guarantees the fundamental rights of the people. The constitution is formulated with due regards to the people's rights their will and the need of the nation in democratic countries. It reflects the characteristics and aspirations of the state. The constitution is essential for the preservation of people's right and justice to fulfill the wish of the people and to direct the nation to a specified goal.**

### Development of Constitution in Nepal

The Constitutional development of Nepal hasn't come a long way. It began with the promulgation of Rana Prime Minister Padma Shumser of constitutional reforms in 2004 BS. It was by the interim Government Act 2007 after the introduction of democracy. Within a short period of seven decades seven different constitutions have been announced so far in Nepal.

SN	Name	Promulgated by	Features
1	Nepal Government Act, 2004 B.S.	Shree Tein P.M Padma Shumsher JBR	<ul style="list-style-type: none"> <li>i. It has 6 parts, 68 articles and a schedule</li> <li>ii. It is the first written constitution of the nation.</li> <li>iii. Provisions for fundamental right and duties, council of ministers, country's assembly, bicameral parliament, public service commission, etc</li> <li>iv. Declaration of free primary education.</li> </ul>
2	Interim Constitution of Nepal, 2007 B.S.	King Tribhuwan	<ul style="list-style-type: none"> <li>i. It has 7 parts, 74 articles and 4 schedules.</li> <li>ii. Provisions for directive principles and policies of government, Council of ministers, chief court, public service commission, advisory council, election commission, financial procedure, etc.</li> <li>iii. Supreme Court became the highest institution of justice.</li> </ul>

3	Constitution of Kingdom of Nepal, 2015 B.S.	King Mahendra	<ul style="list-style-type: none"> <li>i. It has 10 parts, 77 articles and 3 schedules.</li> <li>ii. Provisions for adult franchise, auditor general, Supreme Court, independent judiciary, election commission, ----- and bi cameral legislative, Mahasabha and Pratinidhi Sabha.</li> <li>iii. Divided Nepal into 109 constituencies.</li> </ul>
4	Constitution of Nepal 2019 B.S.	King Mahendra	<ul style="list-style-type: none"> <li>i. Constitution on Supreme Law</li> <li>ii. Nepal as sovereign independent monarchical Hindu kingdom</li> <li>iii. Citizenship based on hamsaj and birth.</li> <li>iv. It has 20 parts 97 articles and 6 schedules.</li> <li>v. Provisions for people fundamental rights adult franchise, Council of ministers directive principles of panchayat system, council of Ministers, Supreme court, etc.</li> </ul>
5	Constitution of Kingdom of Nepal, 2047 B.S.	King Birendra	<ul style="list-style-type: none"> <li>i. It has 23 parts 133 articles and 3 schedules.</li> <li>ii. Provisions for more fundamental rights, sovereignty inherent in people, constitutional monarchy, multiparty democracy, adult franchise, independent judicial, rule of law, etc.</li> <li>iii. King in the parliament.</li> </ul>
6	The interim constitution Nepal, 2063 B.S.	(Speaker Subash Chandra Nembwang)	<ul style="list-style-type: none"> <li>i. It has 25 parts 167 articles 4 schedules.</li> <li>ii. Declaration of Nepal as secular state.</li> <li>iii. Provisions for unicameral legislative parliament, election in the constituent assembly, recognition of the Human Right Commission as a constitutional organ, appointment of the commander in chief by the Prime Minister.</li> </ul>
7	Constitution of Nepal,	Dr Ram Baran Yadhav	<ul style="list-style-type: none"> <li>i. It has 37 parts 212 articles 7 schedules.</li> </ul>

	2072 B.S.		<ul style="list-style-type: none"> <li>ii. Declaration of Nepal as federal republic with seven unnamed states.</li> <li>iii. Provision for bicameral legislative parliament and unicameral parliament in each state, recognition of women's rights, rights of gender and sexual minorities that allows to get citizenship in the chosen gender. And defines the wide range of human rights as fundamental rights.</li> </ul>
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**The Constitution of Nepal, 2015**

The Constitution of Nepal, 2015 came in effect on Sept 20, 2015 (3<sup>rd</sup> Aswin, 2072 B.S.), replacing the Interim Constitution of 2007. The constitution was drafted by the Second Constituent Assembly following the failure of the First Constituent Assembly to produce a constitution in its mandated period. The constitution was endorsed by 90% of the total lawmakers. Out of 598 CA members, 507 voted in favor of the constitution while 25 voted against and 66 members of the Constituent Assembly mainly representing political parties based in Terai boycotted the final debates on the constitution as a protest against states delimitation and inclusion of minorities and Madhesi population in the national and public life.

**The Constituent Assembly**

The Interim Constitution provides for a Constituent Assembly, which was charged with writing Nepal's permanent constitution. Under the terms of the Interim Constitution, the new constitution was to be promulgated by 15<sup>th</sup> Baisakh, 2067, but the Constituent Assembly postponed the promulgation by a year because of disagreements. On 11<sup>th</sup> Jestha, 2068, the Supreme Court of Nepal ruled that the 2067 extension of the Interim Constitution was not right. Since 14<sup>th</sup> Jestha, 2068 the Constituent Assembly repeatedly extended the Interim Constitution.

On 14<sup>th</sup> Jestha, 2069, the Constituent Assembly was finally dissolved after it failed to finish the constitution after the latest extension, ending four years of constitution drafting and leaving the country in a legal vacuum. New elections were held on 4<sup>th</sup> Mangsir, 2070 to the Second Constituent Assembly and political leaders pledged to draft a new constitution within a year. The new assembly expressly committed that the new constitution would be promulgated on 8<sup>th</sup> Magh, 2071. However, due to continued

differences on key issues including system of governance, judicial system and federation issues like number, name and areas of the states to be carved, the constitution could not be finalized and promulgated in time.

### **Basic Features**

The constitution is largely written in gender neutral term. Some of the important aspects of the constitution include the following:

- The Constitution has restructured the Nation into a federal republic. The Constitution has divided the nation into seven states and finalized the march of the Nation towards republicanism from constitutional monarchy and federalism from unitary system.
- Bicameral parliamentary system has been created with two houses at the Center and unicameral parliamentary system in each state.
- Mixed electoral system has been opted for the elections of the lower house at the Center with both first past the post election system and proportional election system are used to elect members of the lower house.
- Rights of gender and sexual minorities are protected by the new constitution with provisions of special laws to protect, empower and develop minority groups as well as allowing them to get citizenship in their chosen gender.
- Recognizing the rights of women, the constitution of Nepal explicitly states that ‘women shall have equal ancestral right without any gender-based discrimination.’
- Nepal also has also continued to abolish the death penalty. Nepal had abolished death penalty in 1990 after the promulgation of the Constitution of the Kingdom of Nepal 1990.
- The Constitution defines wide range human rights as fundamental rights.

### **The Constitutional Bodies**

The constitutional bodies for the nation managed by the interim constitution of Nepal 2063 BS are;

**The Commission for Investigation of Abuse of Authority (CIAA):** The President appoints the chief commissioner and other commissioners of this commission on the recommendation of the constitutional council. The tenure of the commissioner will be six years from the time of appointment. The responsibility of CIAA are to investigate the reported cases of abuse or misuse of authority, to prepare reports of the cases with regard to reported cases of abuse of authority and to litigate the issues in the court of

law for punishment, penalty and recovery and to check corruption in public offices, to warn the people on public post who misuse authority or to recommend for departmental action.

**The Auditor General:** The Auditor General is appointed by the president on the recommendation of the constitutional council. He or she audits the income and expenses of the government offices, departments, all constitutional organs, the police, the army, semi-governmental offices, and pro-public institutions where public investment is more than 50%.

**The Public Service Commission:** The President appoints the chairman and the members of the Public Service Commission on the recommendation of the Constitutional council. 50% members in the Public Service Commission are appointed among those who have served more than 20 years in civil service and the remaining members are appointed from among the renowned persons who have worked in the field of science and technology, arts, literature, law, sociology, public administration or any other fields such as research, teaching, etc. The Public Service Commission monitors, transfers and promotions of the civil servants. It recommends the government with the way to reward and punish civil servants. It selects the appropriate candidates for the post of civil services.

**The Election Commission:** The president on the recommendation of the Constitutional council appoints the Chief Election Commissioner and other commissioners. This commission conducts, checks, and controls elections of any type (general, local, referendum, and the Constituent Assembly) as per the law and constitution of the nation. It updates the voters list, appoints and trains the election officers and directs and supervises them as when required.

**Election Process:** Election is a democratic process in which citizens or the voters can choose their representatives for the legislative or any other organizations. There are four types of elections. They are:-

- **General Election:** People vote to elect their representatives for the legislative body. It is generally conducted after the end of energy set tenure.
- **Mid-term Election:** All the members of the legislative body are dismissed before the end of their tenure and nation goes for a fresh election the set tenure.
- **By-election:** It is conducted only when a member of the legislative body or local bodies dies or reigns then re-election is conducted to fulfill the vacant post.

- **Local election:** People vote in the election conducted at local levels to elect the local representatives.

#### **Authorities to Conduct Election**

- **Election Commission:** There is an Election Commission at the national level to conduct fair election. It gets elections conducted by the election officers and polling officers who work under the Election Commission.
- **Election Officers:** The Election Commission appoints the election officers in the district or constituencies level after the declaration of the election.
- **Polling Officers:** The polling officers are appointed to conduct the election at the polling centers. They have to manage the polling center's security system and conduct election in a legal process. If necessary, the polling officers need to decide the election related cases on the spot or cancel or postpone the election if required.

**The Attorney General:** He or she is appointed by the President on the recommendation of the Prime Minister. Attorney General can remain in the post as per the desire of the Prime Minister. He/she becomes the chief legal advisor of the government and gives advice on constitutional and legal matters. He/she represents the government in any court, offices or government organizations in course of carrying out his/her duties.

**The National Human Rights Commission:** The Chief Commissioner and other commissioners are appointed by the President on the recommendation of the Constitutional Council. Its responsibilities are to promptly obtain information and report on human right violation and rescue the victims and issue order to provide compensation, to prepare and publish annual human right reports, and to ensure respect, protection, promotion and effective implementation of human rights.

**The Constitutional Council:** The constitutional council recommends for the appointment to constitutional bodies according to the constitution. The constitutional council comprises the following chairman and members:

Prime Minister	:	Chairman
Chief Justice	:	Member
Speaker of the House	:	Member
Leader of Opposition Party	:	Member
Chairman of National Assembly	:	Member

While making the recommendation for the post of the Chief Justice, the minister for law and justice and a judge of the Supreme Court also will be a member in the council.



## D. Fundamental Rights and Duties

### Fundamental Rights

Fundamental rights are the basic rights of the people which are essential to safe guard the interest of the people. These rights are also essential for the development of personality of the individual and for social goodness. The Interim Constitution of Nepal 2063 has made provision for the fundamental rights under part 3 from article 12 to 32. The fundamental rights guaranteed by the present constitution are,

1. Right to freedom (article 12)
2. Right to equality (article 13)
3. Right against untouchability and caste discrimination (article 14)
4. Right to publication, transmission and press (article 15)
5. Right to environment and health (article 16)
6. Right to education and culture (article 17)
7. Right to employment and social security (article 18)
8. Right to property (article 19)
9. Right to women (article 20)
10. Right to social justice (article 21)
11. Child right (article 22)
  - ✓ All children shall have right to name and identity.
  - ✓ Every child shall have right to proper care and brought up, basic health care and social security.
  - ✓ Every child shall have rights against physical, mental or any forms of exploitation. Such act of exploitation is punishable by law. And the exploited child shall have rights to compensation as per the arrangements made in law.
  - ✓ Needy, orphans, mentally retarded victims of conflict displaced and vulnerable street children shall have special rights from the state for their secure future.
  - ✓ No children shall be employed in risky work.
12. Right to religion (article 23)
13. Right to justice (article 24)
14. Right against preventive detention (article 25)
15. Right against torture (article 26)
16. Right to information (article 27)
17. Right to privacy (article 28)
18. Right against exploitation (article 29)
19. Right to labor (article 30)

20. Right against exile (article 31)
21. Right to constitutional remedy (article 32)

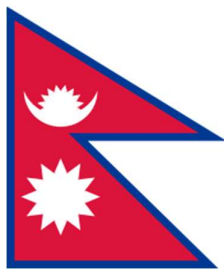
### **Fundamental Duties**

Duty is an obligation of every citizen to do something for the benefit of others and the society he/she lives in .It also includes respecting and upholding the dignity of the constitution. Rights and duties go side by side, so they are interrelated and inseparable, one cannot claim right without fulfilling his/her duties, There are three types of duties as impelled by the present constitution.

- ✓ **Moral Duties:** To lead a simple and honest life with a sense of respect and honors shown to others in the family, teachers, guests and strangers is a moral duty.
- ✓ **Legal Duties:** To respect and obey the existing laws of the state are legal duties. Stealing, Burgling, Swindling, Teasing and Injuring are prohibited under law. We should not indulge in all those things to fulfill a legal duty.
- ✓ **Civil Duties:** civil duties are divided into five sub types.
  - Service to nation
  - Adherence to laws and rules
  - Paying tax
  - Casting of votes
  - Raising voice in favor of truth and justice

## E. National Symbols of Nepal

**National Emblem:** The coat of arms of Nepal was changed during the reconciliation period following the Nepalese Civil War. On 30 December 2006, a new emblem (coat of arms) was introduced. It contains the flag of Nepal, Mount Everest, green hills symbolizing the hilly regions of Nepal and yellow color symbolizing the fertile Terai region, male and female hands joining to symbolize gender equality, and a garland of rhododendrons (the national flower).

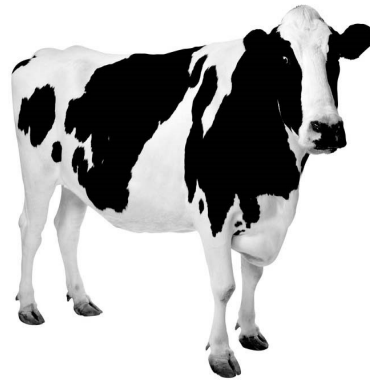


**National Flag:** The national flag of Nepal is the world's only non-quadrilateral national flag. The flag is a simplified combination of two single pennons (pennant). Its crimson red is the color of the rhododendron, the country's national flower. Red is also the sign of victory in war. The blue border is the color of peace. Until 1962, the flag's emblems, the sun and the crescent moon, had human faces. They were removed to modernize the flag.

**National Anthem:** The new national anthem of Nepal "Sayaun Thunga Phool Ka (Made of Hundreds of Flowers)" was officially declared as the national anthem on 3<sup>rd</sup> of August, 2007 by the speaker of the interim parliament, Mr. Subash Chandra Nemwang. The lyrics of the present National Anthem were written by the poet Pradeep Kumar Rai (Byakul Maila) and the music is composed by Amber Gurung.

सयौं थुंगा फूलका हामी, एउटै माला नेपाली  
 सार्वभौम भई फैलिएका, मेची-महाकाली ।  
 प्रकृतिका कोटी-कोटी सम्पदाको आंचल  
 वीरहरूका रगतले, स्वतन्त्र र अटल ।  
 ज्ञानभूमि, शान्तिभूमि तराई, पहाड, हिमाल  
 अखण्ड यो प्यारो हाम्रो मातृभूमि नेपाल ।  
 बहुल जाति, भाषा, धर्म, संस्कृति छन् विशाल  
 अग्रगामी राष्ट्र हाम्रो, जय जय नेपाल ।

**National Animal:** Cow is the National Animal of Nepal. Cattle (colloquially cows) are the most common type of large domesticated ungulates. They are a prominent modern member of the subfamily Bovinae, are the most widespread species of the genus *Bos*, and are most commonly classified collectively as *Bos primigenius*. Cows are not raised as livestock for meat (beef and veal), but as dairy animals for milk and other dairy products, and as draft animals (oxen or bullocks) (pulling carts, plows and the like). The cow being the thing of reverence in Hinduism has a special place in the heart of the Nepalese.



**National Bird:** The Himalayan Monal, *Lophophorus impejanus* also known as the Impeyan Monal or Impeyan Pheasant or Danphe is a bird of genus *Lophophorus* of the pheasant family, Phasianidae. It is the national bird of Nepal, where it is known as the Danphe.



**National Flower:** *Rhododendron arboreum* (Lali guransh) is the national flower of Nepal. *Rhododendron* is a genus of over 1000 species of woody plants in the heath family, either evergreen or deciduous. Most species have showy flowers.

## F. Political Parties of Nepal

An association of likeminded people having the common political objectives or aims, programs and principals or political ideology is a political party.

A party tries to gain power and exercise it by forming a government. A political party acts as a bridge between people and the government. It protects the national sovereignty and integrity through public support and also promotes political socialization and enhances people's participation. Political parties are the public opinion builder and conveyance of people's opinion.

A political party can take part in an election only after its registration with the Election Commission according to the procedure issued from the Election Commission. For this, it must submit its name, address, rules and manifesto along with an application for the registration. Apart from this, the political parties must meet certain conditions;

- i. The constitution and rules of the party must be democratic.
- ii. There should be an arrangement of an election of the executive members at least once in each five year.
- iii. The political party must not have any intension to discriminate against people, threaten national integrity and unity or to promote a party less or one party system.
- iv. The political party cannot promote any single religion, caste, tribe, language or sex or be against the goodness of the country.

### The Multiparty System

In the multiparty system there exist two or more political parties. All of such political parties make their own policies, programs and objectives. People elect the representatives directly. The party securing majority seats in the parliament forms the government and implements its policies and programs for the development of the country. The other minority parties sit on the opposition bench and control the ruling party from going against the interests of the people and the nation. This system is a multiparty democratic system. Without two or more parties, no democracy can be imagined. Political parties integrate scattered thoughts and ideas and give a form and shape to the political process. The role of political parties becomes a strong foundation of the political system. Political participation is the basis to evaluate popularity of the political system.

### **The Role of Political Parties in establishing Democracy**

The political parties played a special as well as an active role in 2007 BS. Nepali Congress Party launched armed revolution against the Rana rule and introduced multiparty democratic system in Nepal. They also played an active role against the party-less Panchayat system after political parties were banned in 2017 BS. Parties, remaining underground and in exile, fought against the Panchayat system until 2046 BS. The political parties launched a joint peaceful movement against the Panchayat system and restored democracy in 2046 BS.

Then, again in 2062/063 BS major seven parties that represented the people in the dismissed House of Representatives launches the peaceful, joint People's movement-II and contributed to its success. The House of Representatives dissolved on Jestha 8, 2059 BS, was restored on 11 Baisakh, 2063 BS by King Gyanendra due to the pressure of the People's Movement-II.

After the restoration of the parliament, leading parties formed the joint government. A joint interim government including Maoists was formed on 18 Chaitra, 2063 to lead the nation before the election of the Constituent Assembly. By the common consensus of the major political parties, Nepal was declared as a Republic state on 15 Jestha, 2065 BS.

### **Some Major Political Parties in Nepal**

(1) Nepali Congress; (2) Communist Party of Nepal, Unified Marxist Leninist (CPN-UML); (3) Unified Communist Party of Nepal, Maoist (UCPN, Maoist); (4) Rastriya Prajatantra Party, Nepal; (5) Madhesi Jana Adhikar Forum, Loktantrik; (6) Rastriya Prajatantra Party (Recently united with Rastriya Janashakti Party); (7) Madhesi Jana Adhikar Forum, Nepal; (8) Terai Madhesh Loktantrik Party; (9) Sadhbhavana Party; (10) Communist Party of Nepal, Marxist-Leninist; (11) Federal Socialist Party; (12) Rastriya Janamorcha; (13) Communist Party of Nepal (United); (14) Rashtriya Madhesh Samajwadi Party; (15) Nepal Workers Peasants Party; (16) Rastriya Janamukti Party; (17) Terai Madhesh Sadhbhavana Party; (18) Tharuhat Tarai Party Nepal; (19) Nepal Pariwar Dal; (20) Dalit Janajati Party; (21) Akhanda Nepal Party; (22) Madhesi Jana Adhikar Forum, Ganatantrik; (23) Nepali Janata Dal; (24) Khambuwan Rashtriya Morchan Nepal; (25) Nepa Rastriya Party; (26) Jana Jagaran Party Nepal; (27) Sanghiya Sadhbhavana Party; (28) Madhesh Samata Party Nepal; (29) Samajwadi Janata Party; (30) Sanghiya Loktantrik Rastriya Manch (Tharuhat).

## G. The Political Situation of Nepal Since 2008

The politics of Nepal function within a framework of a republic with a multi-party system. Currently, the position of President (head of state) is occupied by Bhidhya Devi Bhandari. The position of Prime Minister (head of government) is held by Khagda Prasad Sharma Oli. Executive power is exercised by the Prime Minister and his cabinet, while legislative power is vested in the Constituent Assembly.

Until May 28, 2008, Nepal was a constitutional monarchy. On that date, the constitution was altered by the Constituent Assembly to make the country a republic. Three major parties; the Unified Communist Party of Nepal (Maoist), Communist Party of Nepal (Unified Marxist-Leninist) and the Nepali Congress agreed to write a constitution within 2 years. However, uncooperative and selfish behavior of the political parties has been cited as the major cause behind the de-railing of the peace process.

The Maoists as the largest party of the country took power right after the elections and Pushpa Kamal Dahal (Prachanda) became the Prime Minister of the country. CPN UML also joined this government, but the Nepali Congress took the part of the main opposition party. People soon saw that the country's situation deteriorated. Prachanda also fell into a dispute with the then army chief Rukmangath Katwal and decided to sack him. But the President Ram Baran Yadav, as the supreme head of military power in the country revoked this decision and gave the army chief additional time in office. With this anger Prachanda and his party quit the government and decided to operate as the main opposition to the government headed by CPN UML (Madhav Kumar Nepal as the Prime Minister) and its co-partner Nepali Congress afterwards.

The Maoists have been demanding civilian supremacy over the army to this date forcing closures commonly known as *bandas* (strikes) in the country, and have also declared autonomous states for almost all the ethnic groups in Nepal, seen as a part of revenge against the action that foiled their decision to sack the army chief.

Political leaders continue to discuss plans to end this disorder, but none of the talks have been successful. Rising inflation, economic downturn, poverty, insecurity and uncertainty are the major problems. Many analysts opine that freedom has brought anarchy to the country. People also have doubt on the political parties that whether they will succeed in writing a constitution or not.

On Jestha 14, 2069 constitution assembly was dissolved. And another election to select the constitution assembly members was declared by Dr. Baburam Bhattarai. After the

resignation of the PM Dr. Baburam Bhattarai, the major political parties decided to hold an election by a nonpartisan acting PM Khil Raj Regmi. Then the government of Khil Raj Regmi successfully held the 2nd CA election on Mangsir 4, 2070. The Nepali Congress emerged as the largest party in the 2nd Constituent Assembly, winning 196 of the 575 elected seats. A unicameral body of 601 members was formed in 2nd Constituent Assembly tasked for drafting a new constitution for Nepal. It also served as the country's parliament. It was formed as the result of the 2070 Constituent Assembly elections after the failure of first CA. Nepali Congress formed a new government with the Prime Minister; Sushil Koirala. CPN UML also joined this government but UCPN Maoist took the part of the main opposition party. This CA decided to give a new constitution to the nation on the 8<sup>th</sup> of Magh, 2071 BS but again it failed to draft the new constitution.

Finally, on 3rd of Aswin 2071 (September 20, 2015) a new constitution, 'The Constitution of Nepal 2072' (नेपालको संविधान २०७२) drafted by the Speaker of CA; Subash Chandra Nembwang, under the same government of Sushil Koirala was announced by President Dr. Ram Baran Yadhav in the Constituent Assembly. The Constituent Assembly was transformed into a legislative parliament. The new constitution established Nepal as a federal democratic country by making seven unnamed states. After the declaration of Nepal as a federal democratic country, The Ex Prime Minister of Nepal Sushil Koirala passed away on 25<sup>th</sup> of Magh, 2072.



## H. Questionnaire

### Objective Questions

1. Which Asian country is the first country having written constitution? – Japan (1889 AD)
2. Which is the shortest article of Interim Constitution assembly of Nepal? – Article – 167
3. Which is the latest revised law of the world? – Cyber law
4. How many laws are formed in Nepal up to now? – 305
5. When was Land Reform Program initiated? – 2016 BS
6. Which body of the state makes law in democratic country? – Legislature
7. In how many types can be law classified? – Three (private, public and international)
8. What is the name of the constitution assembly of Ireland? – Third Dial
9. What is the full form of CIAA? – Commission for Investigation of Abuse of Authority
10. Who are the chairman and members of National Security Council? – Prime Minister-Chairperson, Defense Minister-Member, Home Minister-Member
11. When did Interim constitution of Nepal, 2063 declare to be state's law? – Magh 1, 2063 BS
12. Who was the chairperson of the first meeting of constitutional Assembly? – Kul Bahadur Gurung
13. Which is the first foreign investment policy in Nepal? – Foreign Investment and One way policy, 2049
14. How many constitutions were made in Nepal till this time? – 6
15. From when it was started the Value Added Tax (VAT) in Nepal? – 2052 BS
16. In which article of Interim constitution of Nepal, 2063 is discussed about constitutional committee? – Article 149
17. When was it declared “New Muluki Ain” as a law in Nepal? – Bhadra 1, 2020
18. Who is the first person to bring the concept of constitutional government in Nepal? – Padma Shamsher
19. Who are the first president, vice-president and Prime Minister of Republican Nepal? – The first president: Dr. Ram Baran Yadav, Vice-president: Parmananda Jha and the Prime Minister: Phuspa Kamal Dahal ‘Prachanda’.
20. Who was the first elected Prime Minister of Nepal? – B.P. Koirala
21. When did Sushil Koirala take Oath for Prime Minister? – 28 Magh 2070

22. When did Minister for Finance Dr. Ramsharan Mahat present budget for fiscal year 2071/72? – 30<sup>th</sup> Asar, 2071
23. Who is the eldest member of Constitution Assembly-II? – Surya Bahadur Thapa
24. Who was the Chief Election Commissioner when CA-II was held? – Nilakantha Upreti
25. Who became the Prime Minister of Nepal after Khilraj Regmi? – Sushil Koirala
26. Which party became the largest in the second election of CA election of 4 Mangsir 2070? – Nepali Congress
27. Who was the PM of Nepal at the time of second CA election? – Khilraj Regmi
28. When did the second election of CA election take place in Nepal? – 4<sup>th</sup> Mangsir, 2070
29. Who and when became the PM of Nepal after Dr Baburam Bhattarai? – Chief Justice Khilaraj Regmi, 1 Chaitra 2069
30. When was the party Nepali Congress founded? – 1947
31. When was the Constitution Assembly dissolved in Nepal? – Jestha 14<sup>th</sup>, 2069
32. When did PM Dr. Baburam Bhattarai sign the BIPPA? – October 21<sup>st</sup>, 2011
33. When did Dr. Baburam Bhattarai become PM? 11<sup>th</sup> Bhadra, 2068
34. When was Puspa Kamal Dahal (Prachanda) elected as the first PM of the republic Nepal? – 15<sup>th</sup> August, 2008
35. Who is the first deputy PM of republic Nepal? – Sujata Koirala
36. Who was the last King of Nepal? – Gyanendra Shah
37. Who is the youngest martyr of the Mass Revolution-II? – Sagun Tamrakar
38. Who became the first martyr of 19 days Mass Revolution? – Bhimsen Dahal (Kavre)
39. When did Mass Revolution-II start against the rule of Shah in Nepal? – 2062, Chaitra 24
40. For how many days did Mass Revolution-II occur? – 19 days
41. When was the Interim Constitution of Nepal 2063 promulgated? – 1<sup>st</sup> Magh, 2063
42. When did first election of Constitution Assembly occur? – 28<sup>th</sup> Chaitra, 2064
43. When did second election of Constitution Assembly occur? – 4<sup>th</sup> Mangsir, 2070
44. When was republic established in Nepal? – 15<sup>th</sup> Jestha, 2065
45. When did Girija Prasad Koirala die? – 7<sup>th</sup> Chaitra, 2066 (at the age of 87 years)
46. When did maoist participate in Interim government? – 18<sup>th</sup> Chaitra, 2062
47. When did maoist announce the end of battle in 2062? – 18<sup>th</sup> Bhadra
48. When had twelve points treaty occurred between maoist and other seven parties? – 6<sup>th</sup> Mangsir, 2062 (New Delhi)

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49. When did Gyanendra accept all authority to be public? – 11<sup>th</sup> Baisakh, 2063
50. When was Nepal Communist party established? – 6<sup>th</sup> Baisakh, 2006
51. When did the leader Prachanda deliver 1<sup>st</sup> speech publicly in Kathmandu after the twelve years mass battle? – 1<sup>st</sup> Falgun, 2063
52. Who headed the 18<sup>th</sup> SAARC summit held in Kathmandu, Nepal? – Sushil Koirala

### Subjective Questions

53. What do you mean by Legislative?
  - Legislative is one of the important organs of government that make rules and regulations.
54. What are the three organs of democratic government?
  - The Legislative, the Executive, the Judiciary
55. What do you mean by bill?
  - A bill is a written document for a new law that is presented to a country's parliament so that its members can discuss it when the members of the parliament pass it then it becomes the law of the nation.
56. What is Amendment?
  - Amendment is the process of changing a law or a document.
57. What are the functions of legislative?
  - Formulation of laws, controlling the finance, administrative functions and amending the constitution
58. What is unicameral or bicameral parliament? What type of parliamentary system is there now in Nepal?
  - The parliament having only one house is called unicameral parliament and the parliament having two houses is called bi-cameral parliament. There is unicameral parliament in Nepal.
59. What do you mean by sovereignty?
  - Sovereignty means the supremacy of the state, which includes the supreme power to execute all the state affairs independently without any foreign or external control.
60. Who exercises sovereign power in Nepal?
  - People exercise sovereign power in Nepal.
61. What is the rule of law?
  - Rule of law refers to the legal state where the country is ruled as per the main law of the land (constitution), act rules and by laws.

62. What do you mean by Judiciary?
  - The judicial organ of government that interprets the constitution and other laws and protects people's fundamental right is known as judiciary. In other words, judiciary sees that all laws are implemented properly.
63. What are the major powers and functions of legislative?
  - It makes new laws, repels, and amends the old ones, including the constitution.
  - It passes budgets and taxes to be implemented.
  - It can raise questions about the policies and programs of executive.
  - It presents vote of no confidence against executive when required.
  - It withdraws its support to dissolve the council of Ministers.
64. What comprises the executive in our country?
  - President and council of ministers comprise the executive of our country.
65. Mention the functions of executive.
  - Administrative functions, diplomatic functions, Financial Mobilization and Management Functions, Army related Functions
66. Who becomes the chairperson of Security Council, which handles Nepal Army?
  - Prime Minister becomes the chief of the Security Council who handles Nepal army.
67. Which body exercises the executive power in Nepal?
  - The council or Ministers exercise the executive power in Nepal.
68. Who is the chief of executive in the parliamentary democratic system like, Nepal, India and Britain?
  - The Prime Minister is the chief of executive in the parliamentary democratic system like Nepal, India and Britain and President is the head of the state in the present parliamentary system of Nepal.
69. Which part of Interim Constitution -063 mentions about executive?
  - The part 5 of Interim Constitution -063 mentions about executive.
70. What are the major powers and functions of executive?
  - It performs all tasks related to the administration, such as appointing, transferring, and suspending of government officials.
  - It implements laws passed by legislative.
  - It raises taxes and spends them according to the approval of legislative.
  - It also prepares annual budget and carries it out after getting it passed by legislative.
  - It also issues ordinances when the session of parliament is not going on.

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- It is also empowered to deal with the country's diplomatic affairs. This includes sending and receiving ambassadors to and from other countries, negotiates treaties, declaring war and so on.
71. Which court is called the court of record?
    - Supreme Court is called court of record.
  72. How many appellate courts are there in Nepal?
    - There are 16 appellate courts in Nepal.
  73. Which part of Interim constitution -063 deals with Judiciary?
    - There is the provision of judiciary in part 10 of the Interim Constitution of Nepal -063.
  74. Which court of Nepal doesn't function under the Supreme Court?
    - Military Court doesn't function under the Supreme Court.
  75. When does the Chief Justice retire from his office?
    - Chief Justice retires from his office at the age of 65.
  76. How is the Chief Justice of Supreme Court appointed?
    - Chief Justice of Supreme Court is appointed by the president on the recommendation of the Constitution Council.
  77. Make a list of the major powers and functions of Judiciary.
    - To give final interpretation to the constitution and other laws.
    - To protect and promote peoples fundamental rights.
    - To recommend punishment those who break laws.
    - To furnish advice and recommendation to executive whenever necessary.
    - To revise its own decisions as per necessity.
  78. Which is the first political party of Nepal? When was it established?
    - Nepal Praja Parishad is the first political party of Nepal. It was established in 1933 BS Jestha 20.
  79. What is an electoral roll?
    - Electoral roll is the list of the names of people who are eligible to vote.
  80. What is referendum?
    - The process of deciding national issues as per the public opinion through ballots in which the voters must decide between two alternatives.
  81. What is an election manifesto?
    - A manifesto is the election booklet of political parties state what they do if they win the election along with their basic principles, policies ideology and strategy etc.
  82. What is polling centre?

- The place at local level which is fixed by Election Commission for casting vote during the various elections is known as polling centre.
83. What do you mean by claim?
- An application given to amend the mistakes in the electoral roll as name, age, address and fathers name etc is known as claim.
84. What do you mean by ‘oppose’ or ‘protest’?
- Oppose is the act of excluding the name of the dead, migrated, non-Nepali citizen and minor by writing an application to the concerned dection authority.
85. What do you mean by adult franchise?
- The full right of eligible citizen given by a country to caste vote at election is known as adult franchise.
86. What is ballot paper?
- A paper in which the names and symbols of all the candidates consisting for the same post are printed is called Ballot Paper.
87. What is ballot box?
- A very strong heavy and square shaped iron box is given to each of the polling centre (booth). As ballot paper put into it, it is called Ballot box.
88. What is Electoral College?
- Electoral College is a group of authorized voters for an election.
89. What do you mean by proxy vote?
- The vote given in the election by another person on the name of real voter is known as proxy vote.
90. What is the eligible age for voting in Nepal?
- The eligible age to caste vote in Nepal as per the constitution is 18 years.

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## Games & Sports

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Everybody is fond of playing games. It is the means of entertainment and exercise. Sport is generally recognized as activities based in physical athleticism or physical dexterity. Sports are usually governed by rules to ensure fair competition and consistent adjudication of the winner. Records of performance are often kept and reported in sport news. Sport is a major source of entertainment with spectator sports drawing large crowds and reaching wider audiences through sports broadcasting. Generally, the games are categorized into two types that are indoor and outdoor. Outdoor games such as volleyball, football, hockey, cricket, badminton etc are played in open area. Indoor games such as chess, ludo, dice, table tennis, etc are played inside the room.

These days, the games and sports are playing the vital role in establishing the good relation in different field between the countries of the world. So, most of the countries of the world are involved in the ceremony of games and sports. Many international organizations are established like FIFA, ICC, ACC, Olympic; they organize the large festival games and tournament in international level which brings excitement in the people of the world; they celebrate these sports ceremony and take a lot of enjoyment.

### Number of Players on each team

Usually, a number of player and team or group is essential to play a game. This way, different game allowed different number of players on the team.

Sports	No. of Players
✓ Australian Rules Football	18
✓ Hurling, Rugby Football	15
✓ Canadian Football, Korfbal, Women's Lacrosse	12
✓ Football, Cricket, Field Hockey, Soccer, Speed Ball	11
✓ Men's Lacrosse	10
✓ Baseball, Rounder, Kho-Kho	9
✓ Tug-of War	8
✓ Hand Ball, Hot-Ball, Water Polo, Kabaddi	7
✓ Ice Hockey, Volleyball	6
✓ Basketball, Roller Hockey	5
✓ Polo	4
✓ Badminton, Table Tennis, Beach Volleyball, Lawn Tennis	1 or 2
✓ Boxing	1

### National Games of Some Countries

Country	National Games
▪ Nepal	Kabaddi, Dandibiyo
▪ India	Hockey, Kabaddi
▪ China	Table Tennis (Ping Pong)
▪ Bhutan	Bow and Arrow (Archery)
▪ Pakistan	Hockey, Squash
▪ Australia	Cricket, Tennis
▪ America	Baseball
▪ England	Cricket
▪ Canada	Ice Hockey, Lacrosse
▪ Spain	Bull Fighting
▪ Russia	Basketball
▪ Malaysia	Judo
▪ Indonesia	Badminton
▪ Saudi Arab	Chess
▪ France	Croquet
▪ Scotland	Rugby Football



### Playgrounds of Sports

Name of the Sport	Playground
Football	Ground
Cricket	Pitch*
Badminton, Volleyball, handball, Lawn tennis	Court
Boxing, Ice hockey, Skating, Wrestling	Ring
Table tennis	Board
Golf	Link, Green*
Baseball	Diamond
Swimming	Swimming Pool
Horse race	Race course

[\*Pitch in fact is the space between the wickets and not entire cricket field. \*Link, green is the area around the hole only.]

### Cups and Trophies of the Sports

**Football:** Federation Cup, FIFA World Cup, Mardeca Cup, Rovers Cup, European Championship Cup, Colombo Cup

**Basketball:** William Johns Cup

**Cricket:** ICC Cricket World Cup, Asia Cup, Vensah and hedges Cup, Champion Trophy, Fred uncial Cup, Reliance Cup (World Cup), Sheffield Shield, Royals Cup

**Gulf:** Canada Cup, Prince of Wales Cup, Walker Cup

**Tennis:** Davis Cup, Waldron Trophy, Federance Cup, Wait man Cup, Nations Cup

**Polo:** Ezra Cup, Manchester Cup

**Shooting:** North Wales Cup

**Table Tennis:** Asian Cup, Nimbleton Tropy, Devis Cup, Federacy Cup, Korbilan Cup (Female), Uthan Cup, World Cup, Swethling Cup (Male)

**Wrestling:** World Cup, Burnvan Shield

**Bridge:** Hocker Trophy, Smitha Gold Cup

**Hockey:** Welington Cup, Indira Gandhi Gold Cup, Champions Trophy, World Cup

**Horse Racing:** Dorbi, Blue Reband, Grand National Cup

## A. Sports Timeline

Experts argue about the exact origins of many sports. The dates here are generally agreed to be when these sports were first played or contested on an organized basis.

### Sports originated in;

Athletics in 3800 BC	Horse Racing in AD 1540
Boxing in 1681	Rowing in 1715
Ice Skating in 1742	Cricket & Golf in 1744
Swimming in 1791	Baseball in 1839
Rugby Union & Soccer in 1848	Tenpin Bowling in 1850
Show Jumping in 1864	Cycling in 1867
Badminton & Lawn Tennis in 1873	American Football in 1874
Field Hockey in 1875	Hockey & Motor Racing in 1887
Basketball in 1891	Rugby League in 1895
Darts & Motor Cycling in 1896	Speedway in 1902

### Sports originated from;

Different sports originated from different countries of the world.

✓ England	-	Rugby football, Cricket, Table Tennis, Water Polo
✓ China	-	Badminton, Golf, Judo
✓ Japan	-	Karate, Swimming
✓ India	-	Chess, Polo
✓ Korea	-	Taekwondo
✓ Greece	-	Gymnastic, Marathon
✓ Germany	-	Handball
✓ Italy	-	Bingo
✓ Egypt	-	Athletics
✓ Mexico	-	Basketball

## B. Terms Associated with Sports

**Badminton:** Angled Drive Serve, Backhand Low Serve, Bird, Danish wipe, Deuce, Double Drop, Fault, Flick Serve, Forehand Smash, Let, Love All, Smash.

**Baseball:** Base, Bunting, Cather, Diamond, Hitter, Home, Infield, Outfield, Pinch, Pitcher Plate, Pullout, Short Stop, Strike.

**Basketball:** Ball, Basket, Blocking, Dribling, Held Ball, Holding, Jump Ball, Pivot.

**Billiards:** Break, Bolting, Cannon, Cue, In-off, Jigger, Long Jenny, Pot, Scratch, Screw Back, Short Jenny, spot Stroke.

**Boxing:** Babit Punch, Break, Cut, Defence, Down, Hook, Jab, Lying On, Knock, Seconds Out, Slam, Upper Cut, Weight In, Win by Knock-Out.

**Chess:** Capture, Castling, Check Mate, En Passant, Gambit, Openings, Stalemate.

**Cricket:** Ashes, Boundary, Bowling, Caught, Innings, Cover Drive, Crease, Duck, Follow on, Googly, Gully, Hat-trick, Hit Wicket, LBW, Leg-break, Leg-bye, Maiden Over, No Ball, Off Break, On Drive, Out, Over, Pitch, Popping Crease, Run down, Run Out, Sixer, Silly Point, Square Leg, Straight Drive, Stumped, Yorker, Wicket.

**Football:** Corner Kick, Direct Free Kick, Dribble, Goal Kick, Kick-off, Off Side, Penalty Kick, Red Card, Sweeper, Throw in, Tripping. (**Rugby Football:** Scrum, Touch, Try)

**Golf:** Bogey, Bunker, Caddle, Dormy, Fairway, Fourball, Foursome, Greed Holes, Links, Put, Stymied, Tee, Threesome.

**Gymnastic:** A-bars, Angle, Ariel, Blocks, Cone of Swing, Dish, Flairs, Giants, Inocate, Kip, Planche, Punk, Tariff, Tumble, Wrap.

**Hockey:** Advantage, Back-stick, Bully, Carry, Corner, Dribble, Flick, Free-hit, Goal line, Half way Line, Hat-trick, Off-Side, Penalty Stroke, Red Card, Roll-in, Scoop, Short Corner, Square Pass, Stick, Striking Circle, Tackle, Tie-breaker.

**Karate:** Age Zuki, Ai-uchi, Ashibarai, Chakugan, Dachi, Encho Sen, Fudotachi, Gedan, Hajime, Ibuki, Jion, Kakato, Koka, Makiwara, Nidan, Obi, Rei, Sanbon, Shiro, Tobigeri, Ude, Waza-ari, Yoko-ari, Zen-no.

**Polo:** Bunker, Chukker, Mallet. **Horse Racing:** Jockey, Punter, and Steeplechase.

**Table Tennis:** Anti Loop, Backspin, Chop, Counterhit, Flick, Loop, Penhold Grip, Twiddle.

**Tennis:** Ace, Backhand, Deuce, Deep Volley, Double Fault, Fault, Ground Stroke, Half volley, Let, Love, Slice, Smash, Volley.

**Volleyball:** Ace, Attack, Base-line, Blocking, Dig, Doubling, Foot Fault, Heave, Holding, Jump, Set, Lob Pass, Love all, Point, Quick Smash, Scoop, Spike, Service, Volley, Fingering, Digging.

**Wrestling:** Head Lock, Heave, Hold, Reboots, Scissor; **Swimming:** Breast Stroke, Crawl

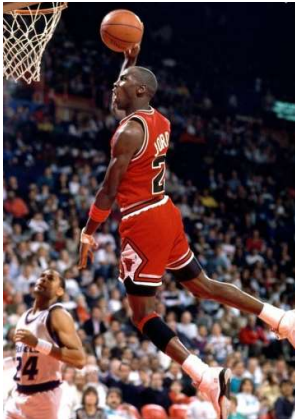
## C. Different Games around the World

### The Marathon

The marathon is a long distance running event that takes its name from a place called marathon in Greece, which was the scene of a battle between Athenian and Persian troops in 490 BC. The Athenians won and supposedly sent a messenger named Pheidippides from Marathon to Athens to spread the news: a distance of about 25 miles. It is said that Pheidippides dropped dead after delivering this message. The current Marathon distance of 26 miles 385 yards (42.195 km) was first used at the 1908 Olympics in Britain. This distance has been the standard for the all marathons since 1924.



### Basketball



Basketball is hugely popular in the USA and is now played in other parts of the world, as well as at the Olympics. The game is played between two teams of five players each, usually on an indoor court. Players score points by shooting the ball through the basket hoop of 18 inches (46 cm) in diameter and 10 feet (3.048 m) high mounted to a backboard at each end. FIBA (International Basketball Federation) is considered as the highest governing body of International Basketball. The National Basketball Association (NBA) in the USA was formed in 1949. It contains 29 teams divided into 2 conferences, Eastern and Western.

### Baseball

Baseball is one of the most popular sports in the USA and is also played in Japan, Mexico, Cuba and a number of South American countries. Baseball is a bat and ball game played between two teams of nine players each who take turns batting and fielding. The offense attempts to score runs by hitting a ball thrown by the pitcher with a bat and moving counter clockwise



around a series of four bases: first, second, third, and home plate. A run is scored when a player advances around the bases and returns to home plate. The major event in the sport is the World Series.

### Golf Majors



The four big competitors in golf are known as the majors. They are the US Masters, British Open, US Open and US PGA Championship, and are played in that order every year. The Masters, founded in 1934, is the only one of the four played on the same course each year, at Augusta National in Georgia, USA. The oldest of the majors is the British Open, which was first held in 1860. The US Open was first played in 1985.

Golf is a club and ball sport in which players use various clubs to hit balls into a series of holes on a course in as few strokes as possible. It is one of the few ball games that do not require a standardized playing area. The game is played on a course with an arranged progression of either nine or 18 holes. Each hole on the course must contain a tee box to start from, and a putting green containing the actual cup.

### Test Cricket

Cricket is a bat and ball game played between two teams of 11 players each. The aim is to score more runs than the opposing team. Among the major Competitors are the Test matches, which are normally played over 5 days. They are called test matches because they were started as a test of the relative skills of the two sides. Test matches are played between teams representing their countries. There are currently ten countries that play Test Cricket. Australia and England first played in 1877, South Africa in 1889, West Indies in 1928, New Zealand in 1930, India in 1932, Pakistan in 1952, Sri Lanka in 1982, Zimbabwe in 1992 and Bangladesh in 2000.



## Badminton



Badminton probably came from old children's game called battledore and shuttlecock. The battledore is a small wooden bat which the player uses to hit the shuttlecock. The game was popular in India and other Asian countries, and the aim was to keep the shuttlecock in the air as long as possible. British army officers played the game in India in the 1860s and they added a net to hit the shuttlecock over. They called the game *poona*. When the officers returned to England they continued enjoying *poona*. The game was renamed badminton at a garden party at the home of Duke of Beaufort in 1873. His home was called Badminton house. By 1877 the first official rules of the game were drawn up and in 1893 the first governing body, the Badminton Association of England was set up. **Badminton's Greatest Player:** Rudy Hartono from Indonesia won the world's oldest badminton tournament, the All-England Championships, a record eight times between 1968 and 1976. He was also the 1980 world champion at the age of 32.

## Volleyball

Volleyball is a team sport in which two teams of six players are separated by a net. Each team tries to score points by grounding a ball on the other team's court under organized rules. It has been a part of the official program of the Summer Olympic Games since 1964. The volleyball court is a rectangle 60 × 30 feet marked by boundary lines 2 inches wide. This area is divided into two equal courts by a central line. A net, 3 feet in height, is suspended across the centre line with its upper edge 8 feet from the floor. The ball is usually played with the hands or arms, but players can legally strike or push (short contact) the ball with any part of the body. A number of consistent techniques have evolved in volleyball, including spiking and blocking as well as passing, setting, and specialized player positions and offensive and defensive structures.



### Snooker and Pool

Snooker was first played by British army officers in India and later became popular in Britain, while pool became in America. Both are becoming more popular on opposite sides of the Atlantic. One of pool's top events is the Mosconi Cup, named after the great American pool players from Europe against those from the USA. The European team has contained some of the most popular snooker players, including Ronnie O'Sullivan, Jimmy White, Steve Davis and Alex Higgins. Steve Davis has played in a record 11 out of 12 Mosconi Cup events since its launch in 1994.

### Formula One

The Formula One World Champion normally lasts from March until October. In 2006 there were 19 races. The Winner in each race receives ten points and runners-up get eight to one points. The driver with the most points at the end of the season is the champion.



**World Champion:** German Michael Schumacher is the world's most successful formula one driver. He has won a record seven world's titles (1994, 1995, 2000, 2001, 2002, 2003, and 2004) and also has the most races win in a season – 13 in 2004.

### Table Tennis

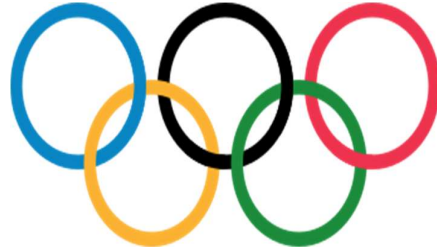


Table tennis, also known as ping pong, is a sport in which two or four players hit a lightweight ball back and forth across a table using a small paddle. The game takes place on a hard table divided by a net. Players must allow a ball played toward them to bounce one time on their side of the table, and must return it so that it bounces on the opposite side at least once. Points are scored when a player fails to return the ball within the rules. Play is fast and demands quick reactions. Spinning the ball alters its trajectory and limits an opponent's options, giving the hitter a great advantage. When doing so the hitter has a better chance of scoring if the spin is successful. Table tennis is governed by the worldwide organization, International Table Tennis Federation (ITTF), founded in 1926. Table tennis has been an Olympic sport since 1988, with several event categories.

## D. The Largest Games and Tournaments

### The Olympic Games

The ancient Olympics games were dedicated to the Olympian gods and held at Zeus in Olympia, Greece on the border between Greece and Macedonia. They began in 776 BC and were held every four years. There were fewer events than now and only Greeks could take part. These festivals included competitions in literature, arts, drama, music and gymnastics. The last Olympiad was held in AD 392. After this, they were banned by the Emperor Theodosius. The games were revived in 1896 when the first modern Olympic Games were held in Athens.



The modern Olympic Games or Olympics are the leading international sporting event featuring summer and winter sports competitions in which thousands of athletes from around the world participate in a variety of competitions. The Olympic Games are considered to be the world's foremost sports competition with more than 200 nations participating. The Olympic Games are held every four years, with the Summer and Winter Games alternating by occurring every four years but two years apart. The modern Olympic games have been held every four years since 1896, except during world wars I and II. Over this time the numbers of competitors, events and nations taking part have all increased dramatically.

**The Olympic Flag:** The five-ring Olympic flag was first raised at the 1920 Antwerp Olympics. The rings on the flag represent the five major regions of the world: the Americas, Europe, Asia, Africa and Australasia. At least one of the colors on the flag (blue, yellow, black, green and red) can be found on the flags of every nation in the world.

### Olympic Table

Year	City/Country	No. of nations	Most Medal
1896	Athens, Greece	14	Greece, 46
1900	Paris, France	24	France, 101
1904	St Louis, USA	12	USA, 239
1906	Athens, Greece	20	France, 40
1908	London, UK	22	UK, 146
1912	Stockholm, Sweden	28	Sweden, 65



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1920	Antwerp, Belgium	29	USA, 95
1924	Paris, France	44	USA, 99
1928	Amsterdam, Netherlands	46	USA, 56
1932	Los Angeles, USA	37	USA, 103
1936	Berlin, Germany	49	Germany, 89
1948	London, UK	59	USA, 84
1952	Helsinki, Finland	69	USA, 76
1956	Melbourne, Australia	72	USSR, 98
1960	Rome, Italy	83	USSR, 103
1964	Tokyo, Japan	93	USA, 90
1968	Mexico City, Mexico	122	USA, 107
1972	Munich, West Germany	121	USSR, 99
1976	Montreal, Canada	92	USSR, 125
1980	Moscow, USSR	80	USSR, 195
1984	Los Angeles, USA	140	USA, 174
1988	Seoul, South Korea	160	USSR, 132
1992	Barcelona, Spain	169	USA, 112
1996	Atlanta, USA	197	USA, 101
2000	Sydney, Australia	199	USA, 93
2004	Athens, Greece	201	USA, 101
2008	Beijing, China	204	USA, 110
2012	London, UK	204	USA, 104
2016	Rio de Janeiro, Brazil	-	-

### FIFA World Cup

The FIFA World Cup, often simply called the World Cup, is an international association football competition contested by the senior men's national teams of the members of Fédération Internationale de Football Association (FIFA), the sport's global governing body. The championship has been awarded every four years since the inaugural tournament in 1930, except in 1942 and 1946 when it was not held because of the Second World War.



The first world cup football was played in 1930 in Uruguay. Thirteen teams took part and the hosts beat Argentina 4-2 in the final in Montevideo. They won the Jules Rimet

trophy, named after the founder president of FIFA when the competition began. FIFA is the organization to run the World Cup Football. It was established in 21<sup>st</sup> May 1904 in Paris, France. France, Belgium, Denmark, Netherland, Spain, Sweden and Switzerland are the founder countries of FIFA. Brazil was allowed to keep the trophy after winning it for the third time in 1970 and it was replaced by the FIFA World Cup trophy. The first World Cup goal was scored by Lucien of France. The goal came 19 minutes into the first World Cup game on 13 July 1930.



FIFA WORLD CUP  
**RUSSIA 2018**

The World Cup is the most widely viewed and followed sporting event in the world, exceeding even the Olympic Games. The 20 World Cup tournaments have been won by eight different national teams. Brazil has won five times, and they are the only team to have played in every tournament. The other World Cup winners are Germany and Italy, with four titles each; Argentina and inaugural winners Uruguay, with two titles each; and England, France and Spain, with one title each.

### FIFA World Cup Table

Year	City/Country	No. of Nations	Total Goal	Winner	Defense
1930	Montevideo, Uruguay	13	70	Uruguay	Argentina
1934	Rome, Italy	16	70	Italy	Czechoslovakia
1938	Paris, France	16*	84	Italy	Hungary
1950	Rio de Janeiro, Brazil	16**	88	Uruguay	Brazil
1954	Bern, Switzerland	16	140	W.Germany	Hungary
1958	Scat home, Sweden	16	126	Brazil	Sweden
1962	Santiago, Chile	16	89	Brazil	Czechoslovakia
1966	London, UK	16	89	England	Germany
1970	Mexico City, Mexico	16	95	Brazil	Italy
1974	Munich, West Germany	16	97	W.Germany	Holland
1978	Buenos Ayers, Argentina	16	102	Argentina	Holland
1982	Madrid, Spain	24	146	Italy	Germany
1986	Mexico City, Mexico	24	132	Argentina	Germany
1990	Rome, Italy	24	115	W.Germany	Argentina
1994	Los Angeles, USA	24	141	Brazil	Italy

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1998	Paris, France	32	171	France	Brazil
2002	Japan/S. Korea	32	161	Brazil	Germany
2006	Berlin, Germany	32	147	Italy	France
2010	S. Africa	32	145	Spain	Netherlands
2014	Brazil	32	171	Germany	Argentina
2018	Russia	32	-	-	-
2022	Qatar	-	-	-	-

Note: \*Austria withdrew after the draw as a result of the Anschluss with Germany leaving the tournament with 15 teams. \*\* Only 13 teams played the 1950 FIFA World Cup but 16 teams entered the seeding groups draw. However, Turkey and Scotland both withdrew before the draw.

### World Cup Football Miscellaneous

**Most world cup appearances:** Brazil - 20 (only country to appear in every World Cup)

**Most championship:** Brazil - 5 (1958, 1962, 1970, 1994, 2002)

**Most appearances in top two:** Germany - 8(1954, 1966, 1974, 1982, 1986, 1990, 2002, 2014) Brazil - 7(1950, 1958, 1962, 1970, 1994, 1998, 2002)

**Most appearance in top eight:** Brazil - 17

**Most times stopped in quarter final:** England - 7

**Fewest matches played:** Indonesia - 1 (as Dutch East Indies)

**Most meetings between two teams:** 7 times, Brazil Vs Italy (1938, 1950, 1958, 1978, 1990 and twice in 1994) and Germany Vs Yugoslavia/Serbia (1954, 1958, 1962, 1974, 1990, 1998 and 2010)

**Most meetings between two teams, Final match:** 2 times, Brazil Vs Italy (1970 and 1994) and 3 times Argentina Vs Germany (1986, 1990 and 2014)

**Most goals scored:** 16, Miroslav Klose (Germany, 2001-2014) and 15, Ronaldo (Brazil, 1998-2006)

**Youngest goal scorer:** 17 years and 239 days, Pele (Brazil Vs Wales, 1958)

**Youngest hat-trick scorer, final:** 17 years and 244 days, Pele (Brazil Vs France, 1958)

**Youngest goal scorer, final:** 17 years and 249 days, Pele (Brazil Vs Sweden, 1958)

**Oldest goal scorer:** 42 years and 39 days, Roger Milla (Cameroon Vs Russia, 1994)

**Oldest hat-trick scorer:** 33 years and 159 days, Tore Keller (Sweden Vs Cuba, 1938)

**Fastest goal in FIFA World Cup:** 10.89 seconds, Hakan Ukur (Turkey Vs Korea Republic, June 29, 2002)

**Biggest margin of victory:** (9-0) Hungary Vs Korea Republic in 1954, (9-0) Yugoslavia Vs Zaire in 1974 and (10-1) Hungary Vs El Salvador in 1982.

**Biggest margin of victory in a final:** (3-0) France Vs Brazil in 1998 and (4-1) Brazil Vs Italy in 1970, (5-2) Brazil Vs Sweden in 1958.

### Euro Cup

The UEFA European Championship, or simply The Euros, is the primary association football competition, determining the continental champion of Europe organized by UEFA (The Union of European Football Associations). It was originally called UEFA European Nations Cup, changing to the current name in 1968 as 'Euro Cup'. The participants of the games are only from Europe. It is held every four years since 1960, in the even-numbered year between World Cup tournaments. This game is also called the mini world cup because this is the second largest Football Game after the World Cup Football. The 14 European Championship tournaments have been won by nine different national teams: Germany and Spain each have won three titles, France has two titles, and Soviet Union, Italy, Czechoslovakia, Netherlands, Denmark and Greece have won one title each.



### Euro Cup Table

Year	Hosting Country	Winner	Defense
1960	France	USSR	Yugoslavia
1964	Spain	Spain	Russia
1968	Italy	Italy	Yugoslavia
1972	Belgium	W. Germany	Russia
1976	Yugoslavia	Czechoslovak	W. Germany
1980	Italy	W. Germany	Belgium
1984	France	France	Spain
1988	W. Germany	Netherlands	Russia
1992	Sweden	Denmark	Germany
1996	England	Germany	Czech Republic

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2000	Belgium, Netherlands	France	Italy
2004	Portugal	Greece	Portugal
2008	Australia, Switzerland	Spain	Germany
2012	Poland, Ukraine	Spain	Italy
2016	France	-	-

### ICC Cricket World Cup

The ICC Cricket World Cup is the international championship of One Day International (ODI) cricket. The event is organized by the sport's governing body, the International Cricket Council (ICC), with preliminary qualification rounds leading up to a finals tournament held every four years. The tournament is one of the world's most viewed sporting events and is considered the "flagship event of the international cricket calendar" by the ICC. The first World Cup was organized in England in June 1975, with the first ODI cricket match having been played only four years earlier. Each of the first three World Cups was held in England. From the 1987 tournament onwards, hosting has been shared between countries under an unofficial rotation system, with fourteen ICC members.



The finals of the World Cup are contested by the ten full members of the ICC (all of which are Test-playing teams) and a number of teams made up from associate and affiliate members of the ICC, selected via the World Cricket League and a later qualifying tournament. A total of twenty teams have competed in the eleven editions of the tournament, with fourteen competing in the 2015 tournament. Australia has won the tournament five times, with the West Indies & India twice each, Pakistan & Sri Lanka once each also having won the tournament.

### World Cup Cricket Table

Year	Organizing Country	Participants	Winner	Defense
1975	England	8	West Indies	Australia
1979	England	8	West Indies	England
1983	England	8	India	West Indies
1987	India/Pakistan	8	Australia	England

1992	Australia/New Zealand	9	Pakistan	England
1996	India/Sri Lanka/Pakistan	12	Sri Lanka	Australia
1999	England	12	Australia	Pakistan
2003	S. Africa/Zimbabwe/Kenya	14	Australia	India
2007	West Indies	16	Australia	Sri Lanka
2011	India/Sri Lanka/Bangladesh	14	India	Sri Lanka
2015	Australia/New Zealand	14	Australia	New Zealand
2019	England	10	-	-
2023	India	-	-	-

### ICC World Twenty-20

The ICC World Twenty20, also referred to as the World T20 or T-20 World Cup is the international championship of Twenty20 cricket organised by International Cricket Council (ICC), the tournament currently consists of 16 teams, comprising all ten ICC full members and six other associate or affiliate members chosen through the World Twenty20 Qualifier. The event has generally been held every two years, although there is a four-year gap to the next scheduled tournament, 2020 in Australia.



Six tournaments have so far been played, and no team had won the tournament on multiple occasions but by the last tournament, West Indies took the second title; 2012 & 2016. The inaugural event, the 2007 World Twenty20, was staged in South Africa, and won by India, who defeated Pakistan in the final at the Wanderers Stadium in Johannesburg. The 2009 tournament took place in England, and was won by the previous runner-up, Pakistan, who defeated Sri Lanka in the final at Lord's. The third tournament was held in 2010, hosted by the countries making up the West Indies cricket team. England defeated Australia in the final in Barbados, which was played at Kensington Oval. The fourth tournament, the 2012 World Twenty20, was held in Asia for the first time, with all matches played in Sri Lanka. The West Indies won the tournament by defeating Sri Lanka in the final, winning its first international tournament since the 2004 Champions Trophy. The fifth tournament, the 2014 ICC World Twenty20, was hosted by Bangladesh, and was won by Sri Lanka, who became

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the first team to play in three finals. And the sixth tournament, 2016 ICC World Twenty20, was hosted by India. And West Indies lifted the cup for the second time beating England in the final.

### Twenty20 World Cup Table

Year	Host	Participants	Winner	Defense	Most Runs
2007	South Africa	12	India	Pakistan	Matthew Hayden
2009	England	12	Pakistan	Sri Lanka	Tillakaratne Dilshan
2010	West Indies	12	England	Australia	Mahela Jaywardene
2012	Srilanka	12	West Indies	Sri Lanka	Shane Watson
2014	Bangladesh	16	Sri Lanka	India	Virat Kolhi
2016	India	16	West Indies	England	Tamim Iqbal
2020	Australia	-	-	-	-

### Asian Games

The Asian Games, also known as Asiad, is a Pan continental multi-sport event held every four years among athletes from all over Asia. The Games were regulated by the Asian Games Federation (AGF) from the first Games in New Delhi, India, until the 1978 Games. Since the 1982 Games they have been organized by the Olympic Council of Asia (OCA), after the breakup of the Asian Games Federation. The Games are recognized by the International Olympic Committee (IOC) and are described as the second largest multi-sport event after the Olympic Games.



In its history, nine nations have hosted the Asian Games. Forty-six nations have participated in the Games, including Israel, which was excluded from the Games after their last participation in 1974. The last Games were held in Incheon, South Korea from 19 September to 4 October 2014.

### Asian Games Table

Year	City/Country	No. of Country	Most Medals
1951	New Delhi, India	11	Japan, 60
1954	Manila, Philippines	18	Japan, 98
1958	Tokyo, Japan	20	Japan, 138

1962	Jakarta, Indonesia	16	Japan, 152
1966	Bangkok, Thailand	18	Japan, 164
1970	Bangkok, Thailand	18	Japan, 144
1974	Tehran, Iraq	25	Japan, 175
1978	Bangkok, Thailand	25	Japan, 178
1982	New Delhi, India	33	China, 153
1986	Seoul, S. Korea	27	S. Korea, 224
1990	Beijing, China	36	China, 341
1994	Hiroshima, Japan	42	China, 266
1998	Bangkok, Thailand	41	China, 274
2002	Busan, S. Korea	44	China, 308
2006	Doha, Qatar	45	China, 316
2010	Guangzhou, China	45	China, 416
2014	Incheon, S. Korea	45	China, 342
2018	Jakarta-Palembang, Indonesia	-	-
2022	Hangzhou, China	-	-

### South Asian Games

The South Asian Games (or SAF Games) are a biennial multi-sport event held among the athletes from South Asia. The governing body of these games is South Asian Sports Council (SASC), formed in 1983. South Asian Sports Council decided to rename the games from South Asian Federation Games (SAF) to South Asian Games (SAG) later in 2004. These Games are often hyped as the South Asian version of Olympic Games. The objective of the SAG games was to spread the message of peace, harmony, brotherhood and sportsmanship to the South Asian countries. The founder members of the Federation are Nepal, India, Pakistan, Sri-Lanka, and Bangladesh. Maldives, Bhutan and Afghanistan got its membership later.

The first South Asian Games were hosted by Kathmandu, Nepal in 1984 and have since been held every two years except for some occasions. These Games are often hyped as the South Asian version of Olympic Games. 12<sup>th</sup> South Asian Games are being held at Guwahati and Shillong from 5 February to 16 February, 2016.





**SAG Table**

Year	Host City/Country	Games	Nation Participating
1984	Kathmandu, Nepal	5	7
1985	Dhaka, Bangladesh	7	7
1987	Kolkata, India	10	7
1989	Islamabad, Pakistan	10	7
1991	Colombo, Sri Lanka	10	7
1993	Dhaka, Bangladesh	11	7
1995	Madras, India	14	7
1999	Kathmandu, Nepal	12	7
2004	Islamabad, Pakistan	15	8
2006	Colombo, Sri Lanka	20	8
2010	Dhaka, Bangladesh	23	8
2016	Guwahati-Shillong, India	22	8
2018	Kathmandu, Nepal	-	-

**National Games**

The National Games is a sporting event held in Nepal. The first national game was held on 27<sup>th</sup> Bhadra 2038 BS at Dasharath Stadium, Kathmandu which was inaugurated by the then King Birendra with a propose of ‘Sports for elite athletes in Nepal’. This game is the largest game of the nation. National Games are held every four year. Firstly, 14 zones of the country used to participate but later 5 development region participated. Again, Nepal Police, Nepal Army and Police Armed Force were added.

**National Game Table**

Games	Year (B.S)	City	Most Medals
I	2038	Kathmandu	Bagmati Zone
II	2040	Pokhara	Bagmati Zone
III	2042	Birjung	Bagmati Zone
IV	2055	Nepalgunj	CDR
V	2065	Kathmandu	CDR
VI	2068	Dhangadi	CDR

## E. Sports Facts and Figure

### Most Competitors

- ✚ The Boston Marathon centenary race in 1996 attracted a record with 38,708 competitors, the most ever for a marathon and world's largest marathon.
- ✚ The Athens Olympic Games, 2004 had 11,099 competitors, the most of any Olympics.
- ✚ The World's biggest road race is the 12 km Bay to Breakers race in San Francisco, USA. It has been held every year since 1912. The 1988 race had a record 78,769 official entries, but the total number of people taking part was probably about 110,000 many of them in fancy dress.
- ✚ In 1929 the Grand National horse race had a record 66 runners, but only 9 of these reached the finish line.

### Other Facts

- ✚ An average soccer player can run almost 5 to 7 miles in a whole ninety minutes of a soccer game.
- ✚ A soccer ball is made up of 32 leather panels, held together by 642 stitches.
- ✚ Korfball is only a sport played with both genders consisting of 4 men and 4 women.
- ✚ Volleyball was invented by William George Morgan of Holyoke, Massachusetts in 1895.
- ✚ Golf is only a sport played on moon. (On 6 Feb, 1971 by Alan Sheppard.)
- ✚ Holes in a golf course must be 4.25 inches in diameter and at least 4 inches deep. A standard golf course contains 18 holes between 100 and 600 yards length.
- ✚ The spots on dice are called pips. The word pip is commonly used for a spot or a speck.
- ✚ In tennis there is most number of officials in compare to the number of players. Likewise, in tournaments of tennis there are 13 officials in regards of 2 players.
- ✚ Fishing is the biggest participants sport in the world.
- ✚ Boxing became the legal sport in 1901.
- ✚ From the beginning of the modern Olympics, Greece and Australia are the only two nations whose athletes have taken part in every Olympic Games.
- ✚ Jesse Owens broke 4 world records in 45 minutes in 1935.
- ✚ The baseball home plate is 17 inches wide.
- ✚ The major league baseball teams use about 850000 balls per season.
- ✚ A baseball has exactly 108 stitches; a cricket ball has from 65 to 75 stitches.
- ✚ One of the first sport programs to be broadcasted on radio was a yacht race that took place in British Water.
- ✚ Sports command the biggest television audiences by the Summer Olympics, World Cup Football and Formula One Racing.
- ✚ A badminton shuttle easily travels 180 km/hr (112 mph).
- ✚ Ferenc Sisz from Romania driving a Renault won the first Formula One Grand Prix held at Le Mans, France in 1906.

## F. Questionnaire

1. When was the first inter-city games organized in Nepal? – Baisakh 29-Jeshtha 5, 2040 B.S. (Hetauda)
2. When and where was the second inter-city games organized? – Chaitra 11-16, 2041 (Biratnagar)
3. When was Nepal Karate Association established? – 1989 A.D.
4. Which Asian games were not participated by Nepal? – 1954 A.D. (Manila) and 1962 A.D. (Jakarta)
5. Who is the Nepali player to obtain the first international medal? – Jit Bahadur K.C. (1973 AD, Track and Field)
6. Who is the first Nepali Player to get Silver Medal in Asian Games? – Sabita Raj Bhandari (1998)
7. Who is the first Nepali Player to obtain the international Golden Medal? – Baikuntha Manandhar
8. Which Nepalese player, for the first time, received medal in Olympics Games? – Bidhan Lama (1998, Taekwondo)
9. When was Games Council established for the development of games? – 2017 B.S
10. When was Games Council changed into National Games Council? – 2021 B.S
11. When and where had Nepal first time participated in International games? – 1951 A.D. , New Delhi (First Asian Games)
12. When was all Nepal Table Tennis Association established? – 2009 B.S
13. When was Nepal Kapardi Association established? – 2035 B.S
14. When was first South Asian Ushu Competition held? – Bhadra 2057 B.S., (Kathmandu)
15. When did Nepal Cricket Association get membership of ICC? – 1988 A.D.
16. What is the name of the International Games held on Chitwan every year? – Elephant Polo
17. Which the saddest day in the history of Nepalese Games? – Falgun 29, 2044 B.S
18. When was Sports museum established in Nepal? – 5 Ashoj 2056 B.S
19. Who is the marathon runner of Nepal to register his name in the Guinness Book of World Records? – Hari Bahadur Rokaya (on 5212 m. height, finishes 3 hours 56 minutes 10 seconds marathon)
20. When and where was the first SAF Football Championship held? – 1997 September 4-13, Kathmandu, Nepal
21. When was South Asian Football Association established? – 1995 December 26
22. When was it started to keep symbol in Olympic? – 1968 (Mexico City, 19<sup>th</sup> Olympic)
23. When were Olympics games started to Broadcast in TV? – 1936, Berlin, 11<sup>th</sup> Olympic

24. Which are the countries to participate in the Olympic Games from the beginning to the modern? – Australia, England, Greece, France and Switzerland
25. Who had first made rules in football games? – Thring and Devinton
26. When was International Basket Ball Association (IBBA) established? – 1932 A.D.
27. Who was the founder of the World Cup Football? – Julius Remit
28. Which is the most victorious country of the World Cup Football? – Brazil
29. Who took the first goal in the World Cup? – Luis Laurent (France)
30. Who is referred by “Last Line of defense, First Line of Attack” in football games? – Goal Keeper
31. Who is the highest goal striker in the World Cup? – Klose, Germany
32. Which world cup is known as the “Santiago War”? – 1962 Santiago, 6<sup>th</sup> World Cup
33. Which is the only country to participate in the entire world cup so far? – Brazil
34. Who first got “Man of the match” in the World Cup cricket? – Clibe Liyed (West Indies)
35. Which is the most victorious country in World Cup Cricket? – Australia
36. Which is the first country to hat trick in World Cup Cricket? – Australia
37. Which is the oldest sports organization of Nepal? – Nepal Cricket Council
38. Which football team is known as the “The Last Cowboy”? – American Football Team
39. Which city of Scotland is known as the ‘Capital of Golf’? – St. Andres
40. What is another name of the Table Tennis ball? – Ping Pong
41. When was Nepal Football Association established? – 2008 B.S
42. Which is the oldest football competition of Nepal? – Tribhuwan Challenge Shield
43. When did Nepal, for the first time, participate in Olympics? – In 1964 (Tokyo, Japan)
44. How many gold medals were won by Nepal in the first SAF Games? – 4 Gold medals
45. Which cricketer said, “I always wanted to be a driver”? – Kapil Dev
46. When was the popular player Ronaldo born? – 1976 AD, Brazil
47. What is another name of football? – Soccer
48. Which country won the first Asian Cup? – South Korea
49. What is the International Federation of chess game? – FIDE
50. Which country is known as ‘Home of Latin American Cricket’? – Argentina
51. How many boxes are there in chess board? – 64 (sixty four)
52. What is the duration of water polo game? – 28 minutes
53. What is the international organization of swimming? – FINA
54. What is the old name of water polo? – Football in the water
55. Which popular footballer acted in a film? – Pele (Brazil)
56. Who is FIFA player of the year 2009? – Lionel Messi (FIFA player 2010 also)

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57. What's the largest organization related to sports? – International Olympic Committee (I.O.C)
58. What is the Olympic held for physical disables? – Para Olympic
59. What is the club with which Hari Khadka related to? – Mahendra Police Club
60. What is Sangita Baidya related to? – Taekwondo
61. Who is the person related to FIFA goal project? – Joseph S. Bloater
62. What is Karl Levis related to? – Athletics
63. When was Nepal Kho-Kho Association established? – 2052 B.S
64. When is International Olympic Run Day celebrated? – June 23
65. In which game the use of left hand is exhibited? – Polo
66. What game is played on riding elephant? – Elephant polo
67. What is the place famous for Elephant polo in the world? – Chitwan, Nepal
68. Who is football player known to the world as the magician of Football? – Pele, Brazil
69. What was the slogan of the fourteen Asiad? – New Vision, New Asia
70. What was the slogan of the fifteenth Asiad? – The Games of Your Life
71. What amount of gold is used in the FIFA World Cup? – 6 Kg (18 Carats)
72. From which World Cup Football did FIFA start announcing the best player? – Fifth World Cup 1954 AD
73. Who was honorable by Mid-western youth player of the year? – Ashish Chaudary, Athletics
74. Who had scored a goal from Nepal's side in the selection round of football of world cup 2014AD held in Dasharath Stadium between Nepal's and Jordan? – Bharat Khawas
75. Which is the organizer company of 'Aha' gold cup, which is organized every year? – Himshree Foods Pvt. Ltd
76. What is the white dress of taekwondo called? – Dobak
77. Who was the first player who had taken 50 wickets in U-19 international cricket championship? – Rahul Bishokarma
78. To whom has Brazil appointed ambassador of world cup football 2014AD? – Pele
79. Who was the famous player of the year 2011 of Europe? – Lionel Messi, Argentina
80. Who is the highest paid footballer in 2014 AD? – Lionel Messi
81. For which country has fair play award given in AFC challenge cup-2012? – North Korea
82. Which is only one International Gulf Championship held in Nepal? – Surya Nepal Masters
83. When and where was International Gulf Championship held in 2012 AD? – Gokharna Forest Gulf Resort (March 13-17)
84. Which country has won trophy of U-19 Female Championship continuously for 3 times? – Nepal
85. 'Our football comes from the heart, their from mind' who said this? – Pele, Brazil
86. Which is the most attended and watched sports in the world? – Soccer

87. Where is the world's highest cricket ground with highest altitude of 2250 m above the sea level? – India
88. What is the name of the sport with the biggest participants in the world? – Fishing
89. What is the only sport played in the moon? – Golf (On 6<sup>th</sup> Feb, 1971 Alan Sheppard hit a golf ball in the moon)
90. What is only a sport played with both genders consisting of 4 men and 4 women? – Korfball
91. When ICC did recognized Nepal as 20-20 international participant? – 28<sup>th</sup> July, 2014
92. Which player was awarded with Ncell Football Player of the year 2071? – Anil Gurung
93. Who is the Nepali player to be the player of the year for three times? – Parash Khadka
94. Who is the first professional wrestler of Nepal? – Manohar Basnet
95. Who is the first Nepali to hold FIFA World Cup? – President Dr. Ram Baran Yadav
96. Who is the Nepali cricketer to make 500 runs in ICC 20-20 cricket? – Parash Khadka
97. When was Nepal Cricket Association established in Nepal? – 2004 BS
98. Who won the highest number of Gold medals in 5<sup>th</sup> National Games? – Karishma Karki
99. Which country won the award of 20-20 Female World Cup in 2014 AD? – Australia
100. Which country won the ACC Premier League 2014 held in Malaysia? – Afghanistan
101. Which club won the English Premier League for the year 2013-14? – Manchester City
102. Which club won the European Champion League 2014? – Real Madrid
103. Who was declared as the ICC player of the year 2013? – Michael Clark
104. Who was declared as the FIFA player of the 2013? – Cristiano Ronaldo
105. Which is the oldest cricket club of the world? – Melburn
106. Which country won the FIFA World Cup 2014? – Germany
107. Where did the FIFA World Cup 2014 held? – Brazil
108. Which countries reached in the semi final of FIFA World Cup 2014? – Germany, Argentina, Netherlands & Brazil
109. Which countries did compete in the Final of FIFA World Cup 2014? – Germany and Argentina (1-0)
110. Which country became the Third and Fourth in the FIFA World Cup 2014? – Third Netherlands and Fourth is Brazil
111. Who bite Gergio Chiliani of Italy in 20<sup>th</sup> FIFA World Cup? – Luis Swerez of Uruguay

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112. Thomas Muller of Germany was the First Hat-trick scorer of 20<sup>th</sup> FIFA World Cup then who was the second Hat-trick scorer? – Sedarn Sakiri of Switzerland
113. Who got the Budweiser Man of the Match Award in 20<sup>th</sup> FIFA World Cup? – Tim Howard, Goalkeeper of America
114. Which player became the all time highest goal scorer in the FIFA World Cup during 20<sup>th</sup> FIFA? – Miroslav Klose (Germany)
115. Who got the Golden Ball being the Best Player of 20<sup>th</sup> FIFA? – Lionel Messi (Captain, Argentina)
116. Who got the Golden Boot scoring the highest 6 goals in Brazil FIFA World Cup? – James Rodriguez (Colombia)
117. Who was declared as the best Goalkeeper to be awarded with Golden Gloves? – Manuel Neuer (Germany)
118. Who scored the winning goal in the final of FIFA World Cup? – Mario Goetze (Germany)
119. What amount of cash prize did the Winner Germany received? – 35 millions dollar
120. In which stadium was the final match of Brazil FIFA World Cup held? – Maracana Stadium

## History



History is the systematic compilation and analysis of past events: human activities, civilization, system of rule, conflict, progress, socio-cultural aspects, and such other important events and process, along with their date, day and year. The term includes cosmic, geologic, and organic history, but is often generically implied to mean human history. Scholars who write about history are called historians. History can also refer to the academic discipline that uses a narrative to examine and analyze a sequence of past events, and objectively determine the patterns of cause and effect that determine them.

Stories common to a particular culture, but not supported by external sources (such as the tales surrounding King Arthur) are usually classified as cultural heritage or legends, because they do not support the disinterested investigation required of the discipline of history. Events occurring prior to written record are considered as prehistory.



## A. Prehistory

Prehistory is the time before events were written down and recorded which literally means 'before history'. The term 'prehistory' can refer to the vast span of time since the beginning of the Universe, but more often it refers to the period since life appeared on Earth.

In dividing up human prehistory, historians typically use the three-age system. The three-age system is the periodization of human prehistory into three consecutive time periods, named for their respective predominant tool-making technologies.

### Stone Age

The Stone Age was a broad prehistoric period during which stone was widely used to make implements with a sharp edge, or a pointed surface. The period lasted roughly three million years. It is divided into two parts:

- **Paleolithic** (Old Stone Age) from about two million to 10,000 BC. It begins with the first use of stone tools. The Paleolithic is the earliest period of the Stone Age. Throughout the Palaeolithic, humans generally lived as nomadic hunter-gatherers. Hunter-gatherer societies tended to be very small and egalitarian.
- **Neolithic** (New Stone Age) from about 10,000 to 3300 BC. Although there were several species of human beings during the Paleolithic, by the Neolithic only *Homo sapiens sapiens* remained. This was a period of primitive technological and social development. The Neolithic is a progression of behavioral and cultural characteristics and changes, including the use of wild and domestic crops and of domesticated animals.

### Bronze Age

The Bronze Age is a time period characterized by the use of bronze, proto-writing, and other early features of urban civilization. The Bronze Age is the second principal period of the three-age Stone-Bronze-Iron system. It started from about 3300 BC and ended in about 2500 BC. People began to make things with bronze, which was more reliable and hardwearing than stone.

The Bronze Age is the earliest period in which some civilizations have reached the end of prehistory, by introducing written records. The Bronze Age is thus considered to be part of prehistory only for the regions and civilizations that adopted or developed a system of keeping written records during later periods. The invention of writing coincides in some areas with the early beginnings of the Bronze Age. Soon after the appearance of writing, people started creating texts including written accounts of events and records of administrative matters.

The term Bronze Age refers to a period in human cultural development when the most advanced metalworking included techniques for smelting copper and alloying with tin, arsenic, or other metals, and then combining them to cast bronze. Worldwide, the Bronze Age generally followed the Neolithic period and the Iron Age generally followed the Bronze Age. By the end of the Bronze Age large states, which are often called empires, had arisen in Egypt, China, Anatolia (the Hittites) and Mesopotamia, all of them literate.

### **Iron Age**

The Iron Age generally started from 1200 BC and ended in about AD 50 to 1000. The Iron Age is the period generally occurring after the Bronze Age, marked by the prevalent use of iron. Iron production is known to have taken place in Anatolia at least as early as 1200 BC.

People used iron for making tools. Bronze is a better material, but iron was more widely available, so cheaper. The early period of the age is characterized by the widespread use of iron or steel. The adoption of these materials coincided with other changes in society, including differing agricultural practices, religious beliefs and artistic styles. The Iron Age as an archaeological term indicates the condition as to civilization and culture of a people using iron as the material for their cutting tools and weapons.

The Iron Age is not part of prehistory for all civilizations who had introduced written records during the Bronze Age. Most remaining civilizations did so during the Iron Age, often through conquest by the empires, which continued to expand during this period.

## B. Historical Periods

History is usually divided into different periods to make it easier to study and talk about. The following are the main periods in the history of the Western world since the fall of the Roman Empire.

### The Early Middle Ages (Dark Ages)

This period came after the fall of the Roman Empire in AD 476, when so-called barbarians (Germanic tribes) took over areas that had been under Roman control. It became known as the Dark Ages because there was very little writing also means that we do not know much about what happened. The early middle Ages came to an end after the Norman Conquest when there was a revival in learning.

### The Middle (Medieval) Ages

This was a very religious time. Most people believed in all-powerful God, responsible for bringing order and prosperity. The Church was very influential and wealthy, and many great cathedrals and monasteries were built during this period. It was a great age of learning, and the first universities were founded in Bologna, then Paris and Oxford. Chartres Cathedral in France was built and the writings of Dante and Chaucer were published.

### The Renaissance

The renaissance began in Italy during the 14<sup>th</sup> century, and spread to northern Europe in the 16<sup>th</sup> century. The name Renaissance comes from the French word for rebirth; people looked back to Greek and Roman ideals in arts such as architecture and sculpture at this time. These ideas spread with the help of printing, which was invented by German Johannes Gutenberg in the mid-15<sup>th</sup> century. The Renaissance was marked by people's belief in progress and personal achievement. The playwright William Shakespeare and the artist Leonardo da Vinci lived and worked during this time.

### The Reformation

In 16<sup>th</sup> century, Europe most people belonged to the Roman Catholic Church, which was headed by the Pope. Some were concerned that the Church was too involved with power and money. Leaders such as Erasmus and Martin Luther wanted people to reject the priests and return to the roots of the Christianity and the Bible. This led to start of Protestantism and its split from the Roman Catholic Church.

### **The Age of Colonialism**

In 1492 Christopher Columbus discovered the Americans. This encouraged many European countries to invade and conquer other smaller or weaker countries so they could use their resources, trade with them or use them as stopping points for their ships. Portugal gained control of what is now Brazil, and Spain took most of Latin America, as well as large parts of what is now the United States. The Dutch gained the Indonesian islands and the French took Canada. Britain was the most powerful colonizing power. It gained 13 colonies in North America, plus Australasia, some Caribbean islands and eventually, vast tracts of Africa and Asia.

### **The Industrial Revolution**

The industrial revolution began with the invention of steam power and steam driven machinery (mainly used in the textile industry) in 18<sup>th</sup> century in Britain. During the followings century inventions such as steam powered ships and railways spread throughout the world. This revolution led thousands of people to leave the countryside and move to crowded slum towns where there were large factories employing huge numbers of workers. The new industries needed better transport to bring supplies and deliver finished goods, so huge network of roads and canals was built during the 18<sup>th</sup> century, followed by railways in 19<sup>th</sup>. The industrial revolution also led to a growth in child labor and a widening divide between rich and poor people.

### **The Modern Age**

During the 20<sup>th</sup> century advances in technology led to great changes in society and global politics. New weapons and military techniques changed the way wars were fought. Huge numbers of people died during World Wars I and II. During the Cold War between the USA and the USSR there was no fighting, but both sides were afraid of the nuclear weapons they were developing.

Factories began to mass produce motorcars which ordinary people could afford. This allowed them to live further from their work places and led to the building of suburbs all over the Western World. Air travel, television and most recently, the Internet have all enabled more people to experience the world beyond their own country. At the same time, cheap domestic appliances such as washing machines and dishwashers allow people more time to spend on activities such as entertainment and shopping.

## C. Historical Events

### 753 BC; Rome Founded

According to legend, Rome was founded by Romulus and Remus, the twin sons of the god Mars and priestess Rhea Silvia. The city is named after Romulus, who killed his brother and ruled as Rome's first King. Rome was the capital of the Roman Empire, which controlled the entire Mediterranean region and far beyond by 44 BC. The entire period of ancient Roman civilization is between 753 BC – 476 AD. Ancient Rome was an Italic civilization that began on the Italian Peninsula as early as the 8th century BC. Located along the Mediterranean Sea and centered on the city of Rome, it expanded to become one of the largest empires in the ancient world.

### 1776; US Independence

The Declaration of Independence was prepared after years of tension between Britain and the American colonies over matters such as taxation. It listed the colonies' complaints and expressed the determination of the people of America to separate themselves from their British rulers. The declaration was signed on 4<sup>th</sup> of July 1776 adopted by the Second Continental Congress meeting at Philadelphia, Pennsylvania. It announced the thirteen American colonies, then at war with the Kingdom of Great Britain, regarded themselves as thirteen newly independent sovereign states, and no longer under British rule. Instead they formed a new nation - the United States of America. John Adams was a leader in pushing for independence. The armed conflict that followed ended with America's victory in 1783. In 1783 the Treaty of Paris recognized the country's independence.

### 1789; French Revolution

The French Revolution was a period of far-reaching social and political disturbance in France that lasted from 1789 until 1799, and was partially carried forward by Napoleon Bonaparte during the later expansion of the French Empire. The French people had many complaints against their system of government, especially the power of the monarchy and the land-owning aristocracy which erupted in a revolution.

The powerful French monarchy was overthrown; King Louis XVI and Queen Marie Antoinette were executed, making way for a new era in which politics and justice were to be decided by the people and finally culminated in a dictatorship under Napoleon that rapidly brought many of its principles to Western Europe and beyond. This was the

French Revolution, which was fought under the slogan 'Liberty, Equality, Fraternity', and the Modern Age began.

### **1917; Russian Revolution**

The Russian Revolution is the collective term for a pair of revolutions in Russia in 1917, which dismantled the Tsarist autocracy and led to the eventual rise of the Soviet Union. The rule of the Russian royal family led by the tsar ended with the February Revolution in 1917. The revolution was triggered by problems such as food shortages and Russian's involvement in the World War I. The October Revolution followed later that year, when Soviet forces seized control. They murdered the tsar and his family and attempted to create a Communist state under the leadership of Vladimir Lenin, which became the first communist revolution in the world. A civil war followed from 1918 to 1922. Soviet rule lasted until 1991.

### **1989; Fall of Berlin Wall**

The Berlin Wall was a barrier that divided Berlin from 1961 to 1989 constructed by the German Democratic Republic; East Germany. After World War II, control of the East German city of Berlin was split between West Germany (with American, British and French troops) and Soviet East Germany. In 1961 the East Germans built the Berlin Wall to stop its inhabitants fleeing to the West, and 192 people were shot while trying to defect. The Wall was a symbol of the divide between the Soviet Union and the West. When the Soviet Union collapsed, the wall was torn down and East and West Germany were reunited, with Berlin as the new capital city.

## D. World Civilizations and Empires

A civilization is any complex or advanced society characterized by urban development, social stratification, symbolic communication forms, and a perceived separation from and domination over the natural environment by cultural elite. It is also referred to the stage of human social development and organization that is considered the most advanced.

### Mesopotamia / Sumeria

Mesopotamia was a region around the Tigris and Euphrates rivers, which is now part of Turkey, Syria and Iraq. The area was controlled by several different peoples, beginning with the Sumerians in around 3500 BC. They set up a number of city-states that constantly battled to control land and trade routes until they were united under one ruler in 2350 BC. The Sumerians are said to have invented the wheel and cuneiform script, which many people claim is the earliest form of writing. They finally became absorbed into other races around 2000 BC.

### Ancient Egypt

Egypt is an area in the Nile valley which was ruled as a single state from about 3200 BC. There were 30 dynasties, led by pharaohs who were both kings and gods. The pyramids were built during the fourth dynasty (2575-2467 BC) as tombs for the pharaohs of that time. The Great Pyramid of Giza was the world's tallest building for 4000 years, and it is the only wonder of the World that still stands. The Egyptians are also famous for their hieroglyphic writing and sea-going ships. Like other powerful empires, ancient Egypt was weakened by invasions, until it was taken over by Alexander the Great in 332 BC.

### Ancient Greece

Ancient Greece was called Hellas. The civilization was at its strongest in 500-400 BC, after Greece colonized Cyprus, parts of Italy, the Ukraine and the South of France. This era was known as the Golden Age. Some city-states, such as Athens and Sparta, became great centers of art, learning and politics. Many famous thinkers lived in Athens during this period, including Aristotle, Plato, Socrates and Aristophanes. The ancient Greeks also created the idea of democracy; its citizens were encouraged to debate and then vote on issues. The Golden Age ended in wars between the city city-states, which paved the way for King Philip of Macedonia to invade Greece, followed later by his son Alexander.

### Alexander the Greats Empire

Alexander III of Macedonia lived for only 33 years, from 356 to 323 BC. In that short time he built an empire covering Persia (modern Iraq, Iran, Syria, and Turkey), Egypt, Greece, and Babylon. It was difficult to keep this huge empire together, and it collapsed soon after his death.

### **Chinese Empire**

China was one of the first places where people are known to have lived. From 1600 BC it was made up of many small kingdoms which all united in 221 BC under one leader or emperor. Various dynasties ruled the empire, starting with the Qin dynasty. During this time, the Great Wall of China was built to keep invaders out. China was extremely learned civilization, ahead of Europe in the arts and sciences by up to 200 years. The empire finally fell apart under the Han dynasty in AD 220 as a result of corruption and poverty.

### **Roman Empire**

The Roman Empire was formed in 31 BC under the leadership of Caesar Augustus, who ruled over every aspect of Roman life. Caesar Augustus brought peace, prosperity and culture. The empire expanded so much that by the 2<sup>nd</sup> century AD Rome had colonies which stretched from the Middle East to Spain and from Great Britain to North Africa. The sheer size of the empire brought problems. There was not enough money to pay for an army spread across the world, which made the empire vulnerable to enemies. Constant attacks by German barbarians eventually defeated the army, and the empire fell in AD 476. The influence of Ancient Rome is staggering: Roman roads still cross Europe, the Roman legal system is still the model for countries in Europe and Latin America, and its language, Latin, is the basis of many languages spoken today.

### **British Empire**

At the beginning of the 20<sup>th</sup> century, about a quarter of the world's people lived under British rule. The British had been expanding their empire since the 15<sup>th</sup> century, and by 1900 its lands included South Africa, Kenya, Egypt, Hong Kong, India, Iraq, Nepal, Singapore, Malta, Australia, New Zealand and Canada. Most of Britain's former colonies have now won or been granted independence. Many belong to the Commonwealth, which is a voluntary association of independent states founded in 1930.

### **US Presidents**

US presidents are elected for a term of four years. George Washington was the first president of the USA and he served two terms. Only Franklin Delano Roosevelt served three terms. He was elected for a fourth term, but died shortly afterwards. In 1951 the 22<sup>nd</sup> Amendment to the US Constitution ruled that two terms are the most any president may serve. The two main political parties in USA today are the Democratic and the Republican.



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	<b>Name of the President</b>	<b>Party</b>	<b>First Elected</b>
1.	George Washington	Independent	1789
2.	John Adams	Federalist	1797
3.	Thomas Jefferson	Dem-Rep	1801
4.	James Madison	Dem-Rep	1809
5.	James Monroe	Dem-Rep	1817
6.	John Quincy Adams	Dem-Rep	1825
7.	Andrew Jackson	Democrat	1829
8.	Martin Van Buren	Democrat	1837
9.	William Henry Harrison	Whig	1841
10.	John Tyler	Whig	1841
11.	James Knox Polk	Democrat	1845
12.	Zachary Taylor	Whig	1849
13.	Millard Fillmore	Whig	1850
14.	Franklin Pierce	Democrat	1853
15.	James Buchanan	Democrat	1857
16.	Abraham Lincoln	Republican	1861
17.	Andrew Johnson	Democrat	1865
18.	Ulysses Simpson Grant	Republican	1869
19.	Rutherford B. Hayes	Republican	1877
20.	James Abram Garfield	Republican	1881
21.	Chester Alan	Republican	1881
22.	Grover Cleveland	Democrat	1885
23.	Benjamin Harrison	Republican	1889
24.	Grover Cleveland	Democrat	1893
25.	William McKinley	Republican	1897
26.	Theodore Roosevelt	Republican	1901
27.	William Howard Taft	Republican	1909
28.	Woodrow Wilson	Democrat	1913
29.	Warren G. Harding	Republican	1921
30.	Calvin Coolidge	Republican	1923
31.	Hebert Clark Hoover	Republican	1929
32.	Franklin Delano Roosevelt	Democrat	1933
33.	Harry S. Truman	Democrat	1945
34.	Dwight David Eisenhower	Republican	1953
35.	John Fitzgerald Kennedy	Democrat	1961
36.	Lyndon Baines Johnson	Democrat	1963
37.	Richard Milhous Nixon	Republican	1969
38.	Gerald Rudolph Ford	Republican	1974
39.	Jimmy Carter	Democrat	1977
40.	Ronald Reagan	Republican	1981
41.	George Bush	Republican	1989
42.	Bill Clinton	Democrat	1993
43.	George W. Bush	Republican	2001
44.	Barack Obama	Democratic	2009

## E. World Wars

### First World War

A world war is the situation in which many countries of the world are involved directly or indirectly in armed fighting against their rival bloc. The countries of one bloc may give arms or funds and send military forces to the battle front to fight against the military of rival bloc. In 1914 AD a war broke out which seriously affected the whole world. Today this war is known as the First World War.



After the unification of Germany and Italy in 1870 these countries converted as imperialist countries. Along with unification, German Chancellor (Prime Minister) Otto Von Bismarck added two states of France namely Alsace and Lorraine in his country which made France and Germany as enemy countries; it is the seed sowing of First World War. Not only this but also, with a view to make France alone, Bismarck made treaty with Austria – Hungary and Italy to get their favor in his alliance. Thus he began the age of alliance. As long as Otto Von Bismarck remained in the post of Chancellor, he did not let others make such alliance against him. After the death of German Emperor William I, his son Frederic I became the emperor followed by his sons William II. Otto Von Bismarck resigned from his post in 1890 after two years of William II accession to the throne. After that France made two different treaties with Russia and Britain. This divided the whole Europe into two groups. The other reason of First World War beside this is Balkan War.

To the Balkan area of Turkey there was a great empire called Ottoman Empire. Later on, as Turkey got divided and became weaker it was called the ‘Sick Man in Europe’. Balkan countries: Greece, Bulgaria, Serbia and Montenegro made the Balkan league. The countries of this league attacked Turkey and defeated it. It is called the first Balkan War. After this according to London Treaty these four countries divided the part of land they had got from Turkey into four smaller parts and added one for each country, apart from this, another country called Albania emerged. Among the countries in Balkan League Bulgaria was dissatisfied with the land got after London Treaty. It attacked Serbia in 1913 AD. Greece, Romania and Turkey helped Serbia, and Bulgaria was

defeated. This war is called the second Balkan War. After this Balkan war, the size of Serbia increased. As a benefit from the instability of Balkan region, Austria-Hungary took over two states of Turkey namely Bosnia and Herzegovina, which lie to the west of Serbia. In these states mostly Serbians lived and wanted to unite with Serbia. Serbia also wanted to have a way to reach Adriatic sea port through Bosnia and Herzegovina. Therefore, Serbian youths established an institution to take action against Austria-Hungary. The institution was called 'Unity of Death' or 'Black Hand'.

In this course, on 28 June, 1914 the crown prince of Austria-Hungary Archduke Franz Ferdinand, along with his wife Sophia Chotek visited Sarzevo, the capital city of Bosnia. During the visit, a member of Black Hand, 19 years old Bosnian student Gavrilo Princip murdered this couple, shooting from nearby. This murder happened to be the immediate cause of First World War. After one month of this murder the First World War broke.

After one month of death of Archduke Franz Ferdinand and his wife Sophia Chotek, in the hints of Germany, on 26<sup>th</sup> July 1914, the emperor of Austria-Hungary Franz Joseph, thinking that there was a role of Serbian Government, wrote a telegram message to the King Peter of Serbia, advising him to suppress all the members of Black Hand. He further added that Austro-Hungarian officials should be permitted to supervise the suppression. With this, an additional message was that the reply of the message had to be given within 24 hours. On 27<sup>th</sup> July, 1914 Serbian government replied it stating that they could suppress the Black Hand members but would not permit the Austria-Hungary officials to supervise it. Now the two countries did not have any other alternatives but war.

### **Major Events of First World War**

<b>Date</b>	<b>Events</b>
28 June 1914	Assassination of Archduke Franz Ferdinand of Austria, the heir to the Austro-Hungarian throne, who is killed in Sarajevo along with his wife, Duchess Sophie.
28 July 1914	Austria-Hungary declares war on Serbia. Russia mobilizes.
31 July 1914	Germany warns Russia to stop mobilizing. Russia says mobilization is against Austria-Hungary only.
1 Aug 1914	Germany declares war against Russia, Italy declares its neutrality, France orders its army to support Russia. Germany and the Ottoman Empire sign a secret alliance treaty.

3 Aug 1914	Germany declares war on France and Belgium.
4 Aug 1914	Germany invades Belgium to outflank the French army. Britain protests the violation of Belgian neutrality, guaranteed by a treaty; German Chancellor replies that the treaty is just a scrap of paper. The United Kingdom declares war on Germany.
12 Aug 1914	The United Kingdom and France declares war against Austria-Hungary.
20 Oct 1914	The First Battle of Ypres begins, many solders dies in the war of Belgium city, Ypres.
23 May 1915	Italy joins the Triple Alliance and declares war on Austria.
15 Oct 1915	The United Kingdom declares war against Bulgaria.
27 Aug 1916	Romania declares war against Austria.
28 Aug 1916	Italy declares war against Germany.
6 April 1917	USA declares war against Germany.
7 Aug 1918	Black Day of German force.
9 Nov 1918	German Emperor Kaiser William II fled to Holland.
11 Nov 1918	At 6 am, Germany signs the Armistice of Compiegne. End of fighting at 11 a.m.
18 Jan 1919	Treaty of Versailles between the Allies and Germany: the Peace Conference opens in Paris.
29 Jun 1919	Treaty of Versailles signed and the war ends.
10 Jan 1920	First meeting of the League of Nations held in London. Official end of World War I.

## Second World War



On September 1939, Hitler, the then ruler of Germany, started the Second World War by attacking Poland. Japan, a powerful country of East Asia, took part in the First World

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War from the side of the Allied countries but Japan could not get the expected benefit from the Treaty of Versailles. So, it actively involved itself in the Second World War as an Axis power.

In the early years of the war, Germany achieved great success. Germany made the Allies weak and invaded Czechoslovakia, Poland, Denmark, Norway, Belgium, Holland etc and so did Italy.

On 17 May 1940, Germany defeated France. Encouraged by the victory of Hitler over France, Japan attacked French Indochina and the Dutch East Indies and occupied them. The USA asked Japan to stop invasion but Japan did not. So, the USA stopped supplying raw materials such as oil and iron ore to Japan, and imposed an economic blockade. Japan went on expanding its territory in East Asia.

The economic blockade by the USA had adverse effect on Japanese economy. So, Japanese Air force Admiral Yama Tomo bombarded the American fleet at Pearl Harbor at Hawaii on 7 December 1941. Then, the USA declared war against the Axis Power on 8 December 1941. Soon after that, Japan occupied Hong Kong, Malaya, Formosa (Taiwan), Burma (Myanmar), Indochina and Indonesia.

There were American military bases in the Pacific Ocean. Japan attacked these bases to capture them. In these attacks, American troops defeated Japan, but Japanese troops did not surrender. After the Battle at Midway on 4 June 1942, Japan began to lose ground and was gradually defeated.

Even then, the Japanese troops were given the order not to retreat from the battlefields. Until 19 May 1945, all the countries of the Axis Power except Japan had surrendered. The Japanese used to say “The Japanese are great patriots who prefer death to submission.” After the surrender of Germany in 1945, Japan was fighting alone with 44 countries. American bombers dropped atom bombs on Hiroshima on 6 August 1945 and Nagasaki (9 August 1945), two important cities in Japan, as a means to force Japan to surrender.

Then Japan surrendered to the Allies unconditionally on 14 August 1945. It was ready to hold peace talks on 12 September 1945, which formally ended the war.

### Major Events of Second World War

Date	Events
10 Mar 1939	Germany attacks Czechoslovakia and annexed it.

1 Sept 1939	Germany attacks Poland.
3 Sept 1939	Britain and France declared war against Germany.
9 Apr 1940	Germany attacks Denmark and Norway.
30 Apr 1940	Japan joins the Axis Powers.
10 May 1940	Germany attacks Belgium, the Netherlands and Luxemburg.
17 May 1940	Germany attacks France.
10 June 1940	Italy declared war against Britain and France.
10 July 1940	Britain starts taking part in war.
28 Oct 1940	Italy attacks Greece.
6 Apr 1941	Germany attacks Yugoslavia and Greece.
21 Apr 1941	Greece surrenders to Germany.
22 June 1941	Germany attacks Russia.
1 Sept 1941	Italy attacked Egypt.
7 Dec 1941	The Japanese Air Force attacks the American ship at Pearl Harbor.
8 Dec 1941	America declares war against the Axis Power.
27 Feb 1942	Ocean war at Java.
4 May 1942	Coral Ocean war.
4 June 1942	The Battle of Midway.
3 Sept 1943	Italy surrenders.
25 Aug 1944	Allies makes Paris free.
17 Jan 1945	Russia invades Warsaw.
12 Apr 1945	US president Franklin D. Roosevelt dies.
28 Apr 1945	Mussolini murdered.
30 Apr 1945	Hitler and his beloved Eva Braun committed suicide.
7 May 1945	Germany finally surrenders at Rheims.
6 Aug 1945	The USA drops the first atomic bomb on Hiroshima, Japan.
9 Aug 1945	The USA drops the second atomic bomb on Nagasaki, Japan.
12 Sept 1945	Japan surrenders and the war ended.

## F. Chief Political Murder in the World History

People	Date of Murder
Abraham Lincon	14 <sup>th</sup> April 1865
William Mackinley	6 <sup>th</sup> September 1901
King Ferdinand	28 <sup>th</sup> June 1914
Mahatma Gandhi	30 <sup>th</sup> January 1948
John F. Kennedy	22 <sup>nd</sup> November 1963
Martin Luther King	4 <sup>th</sup> April 1968
Robert F. Kennedy	5 <sup>th</sup> June 1968
Salim Robaya Ali	26 <sup>th</sup> October 1984
Jiyaul Rahman	30 <sup>th</sup> May 1981
Indira Gandhi	31 <sup>st</sup> October 1984
Rajiv Gandhi	21 <sup>st</sup> May 1991
Liyakat Ali Khan	16 <sup>th</sup> October 1951
Anwar Al Sadat	6 <sup>th</sup> October 1951
Mohammad Budayaf	24 <sup>th</sup> June 1992
Etjyak Rabin	4 <sup>th</sup> November 1995
Ransindhe Prendas	1 <sup>st</sup> May 1993
Hakija Turajalik	8 <sup>th</sup> January 1993
Martaja Bhutto	20 <sup>th</sup> September 1996
Aaendrei Lukanov	2 <sup>nd</sup> October 1996
The Royal Family of King Birendra*	1 <sup>st</sup> June 2001(19 <sup>th</sup> Jestha 2058)

[\*The Nepalese Royal Massacre occurred on 19<sup>th</sup> of Jestha, 2058 at around 09:00 PM, at a house in the grounds of the Narayanhity Royal Palace; former home of the Royal Family. It was reported that the heir to the throne, Crown Prince Dipendra, killed nine members of his family and himself during a party or monthly reunion dinner of the royal family in the house. The dead included his parents, King Birendra of Nepal and Queen Aishwarya. Prince Dipendra became de jure King of Nepal upon his father's death and died in hospital three days after the massacre without recovering from a coma.]

## G. The First in the World

Status	Name	Country
The first Prime Minister	Sir Robert Walpole	Great Britain
The first ever woman Prime Minister of a country in the world	Mrs. Sirimavo Bandaranaike	Sri Lanka
The first President	Sun Yat Sen	China
The first lady President of a country	Maria Isabel Peron	Argentina
The first chairman of the central Government of People's Republic of China	Mao-Tse-Tung	China
The first Governor General	Mohammad Ali Jinnah	Pakistan
The first Emperor	Julius Cesar	Egypt
The first Pilot	Valeria Khomya Kova	
The first President of USA	George Washington	USA
The first President of China	Dr. Sun Yat Sen	China
The first President of Nepal	Dr. Ram Baran Yadhav	Nepal
The first Space Traveler	Yuri Gagrian	Russia
The first European to visit China	Marco Polo	
The first woman to climb Mt. Everest	Junko Tabei	Japan
The first man to climb Mt. Everest	Tenzing Norgay & Edmund Hillary	Nepal & New Zealand
The first person to reach North Pole	Robert Peary	USA
The first person to reach the South Pole	Roald Amundson	Norway
The first woman to reach the North Pole	Mrs Fran Phipps	Canada
The man to set foot on the moon	Neil Aiden Armstrong	USA
The man to walk in space	Alexes Leonov	Russia
The first Nobel Prize winner in literature	Sully Prudhomme	France
The first doctor to transplant human heart	Dr. Christain Bernard	USA
The first organization to forecast on general weather	British Broadcasting Corporation, BBC	UK
The first general secretary of UN	Trygve Lie	Norway
The first country to make written constitution		USA
The first country to use wall calendar		Egypt



## H. The Political Activities of Nepal

### 1990–1996: Parliamentary Monarchy

Until 1990, Nepal was an absolute monarchy running under the executive control of the king faced with a people's movement against the absolute monarchy. King Birendra in 1990, agreed to large-scale political reforms by creating a parliamentary monarchy with the king as the head of state and a prime minister as the head of the government.

Nepal's legislature was bicameral consisting of a House of Representatives and a National Council. The House of Representatives consisted of 205 members directly elected by the people. The National Council had 60 members, 10 nominated by the king, 35 elected by the House of Representatives and the remaining 15 elected by an electoral college made up of chairs of villages and towns. The legislature had a five-year term, but was dissolved by the king before its term could end. All Nepalese citizens of 18 years and older became eligible to vote.

The executive comprised the King and the Council of Ministers (the Cabinet). The leader of the coalition or party securing the maximum seats in an election was appointed as the Prime Minister. The Cabinet was appointed by the king on the recommendation of the Prime Minister. Governments in Nepal have tended to be highly unstable; no government has survived for more than two years since 1991, either through internal collapse or parliamentary dissolution by the monarch.

In the first free and fair elections in Nepal in 1991, the Nepali Congress was victorious. The 1994 election defeated the Nepali Congress Party by the Communist Party of Nepal (Unified Marxist-Leninist) (CPN-UML) and made Nepal as the first communist-led monarchy in Asia with Man Mohan Adhikari, Prime Minister. In mid-1994, parliament was dissolved due to dissension within the Nepali Congress Party. The subsequent general election, held 15 November 1994, gave no party a majority and led to several years of unstable coalition governments. As of the May 1999 general elections, the Nepali Congress Party once again headed a majority government. There have been three Nepali Congress Party Prime Ministers since the 1999 elections: Krishna Prasad Bhattarai (31 May 1999 – 17 March 2000); Girija Prasad Koirala (20 March 2000 – 19 July 2001); and Sher Bahadur Deuba (23 July 2001 – 2003). The final distribution of seats in Parliament gave Nepali Congress 113; CPN-UML 69; RPP 11; RJM 5; NSP 5; the Workers and Peasants Party 1; and the United People's Front 1. Then the Nepali Congress Party divided into two fragments; Nepali Congress Party led by G. P. Koirala and Nepali Congress (Democratic) led by Sher Bahadur Deuba. Former Prime Minister

and Influential Leader Krishna Prasad Bhattarai have expressed his support for Nepali Congress (Democratic). Both Congress parties regard Krishna Prasad Bhattarai as their main leader.

### **1996: Maoist insurgency**

In February 1996, the Communist Party of Nepal (Maoist) began a violent insurgency in more than 50 districts. About 13,000 police, civilians, and insurgents have been killed in the conflict since 1996. In July 2001 Prime Minister Deuba announced a cease-fire, which the Maoists pledged to observe, as part of a government effort to seek a negotiated solution to the conflict. Although Maoist-instigated intimidation and extortion continue, the killings have largely subsided since the cease-fire was announced. The government and Maoists held a talk in August and September 2001.

Political parties agreed in 1991 that the monarchy would remain to enhance political stability and provide an important symbol of national identity for the culturally diverse Nepali people. The King exercises limited powers, including the right to declare a state of emergency in the event of war or armed revolt, with the advice and consent of the Council of Ministers and the Prime Minister. According to the constitution, the King's declaration of a state of emergency must be approved by a two-thirds majority of the lower house of the Parliament.

### **2001: Royal massacre**

On 1<sup>st</sup> June 2001, Crown Prince Dipendra was officially reported to have shot and kill his father, King Birendra; his mother, Queen Aishwarya; his brother; his sister, his father's younger brother, Prince Dhirendra; and several aunts, before turning the gun on himself. Although he never regained consciousness before dying, Crown Prince Dipendra was nonetheless the king under the law of Nepalese royal succession. After his death two days later, the late King's surviving brother Gyanendra was proclaimed the king. Although official statements declared Crown Prince Dipendra as the killer, later on King Gyanendra has also been suspected for the massacre.

### **2005–2007: Suspension of Parliament and Loktantra Andolan**

On 1<sup>st</sup> February 2005, King Gyanendra suspended the Parliament, appointed a government led by himself, and enforced martial law. The King argued that civil politicians were unfit to handle the Maoist insurgency. Telephone lines were cut and several high-profile political leaders were detained. Other opposition leaders fled to India and regrouped there. A broad coalition called the Seven Party Alliance (SPA) was formed in opposition to the royal takeover, encompassing the seven parliamentary parties who held about 90% of the seats in the old, dissolved parliament.

The UN-OHCHR, in response to events in Nepal, set up a monitoring program in 2005 to assess and observe the human rights situation. On 22<sup>nd</sup> November 2005, the Seven

Party Alliance (SPA) of parliamentary parties and the Communist Party of Nepal (Maoist) agreed on a historic and unprecedented 12-point memorandum of understanding (MOU) for peace and democracy. Nepalese from various walks of life and the international community regarded the MOU as an appropriate political response to the crisis that was developing in Nepal. Against the backdrop of the historical sufferings of the Nepalese people and the enormous human cost of the last ten years of violent conflict, the MOU, which proposes a peaceful transition through an elected constituent assembly, created an acceptable formula for a united movement for democracy. As per the 12-point MOU, the SPA called for a protest movement, and the Communist Party of Nepal (Maoist) supported it. This led to a countrywide uprising called the Loktantra Andolan that started in April 2006. All political forces including civil society and professional organizations actively galvanized the people. This resulted in massive and spontaneous demonstrations and rallies held across Nepal against King Gyanendra's autocratic rule.

The people's participation was so broad, momentous and pervasive that the king feared from being overthrown. On 21<sup>st</sup> April 2006, King Gyanendra declared that power would be returned to the people. This had little effect on the people, who continued to occupy the streets of Kathmandu and other towns, openly defying the daytime curfew. Finally King Gyanendra announced the reinstatement the House of Representatives, thereby conceding one of the major demands of the SPA, at midnight on 24 April 2006. Following this action the coalition of political forces decided to call off the protests. Many people died and thousands were injured during the 19 days of protests.

On 19<sup>th</sup> May 2006, the parliament assumed total legislative power and gave executive power to the Government of Nepal (previously known as His Majesty's Government). Moreover, Nepal was declared a secular state abrogating the previous status of a Hindu Kingdom. However, most of the changes haven't been implemented yet. On 19<sup>th</sup> July 2006, the Prime Minister G. P. Koirala, sent a letter to the United Nations announcing the intention of the Nepalese government to hold elections to a constituent assembly by April 2007.

### **Dec 2007 - May 2008: Abolition of the monarchy**

On 23<sup>rd</sup> December 2007, an agreement was made for the monarchy to be abolished and the country to become a federal republic with the Prime Minister becoming head of state. The April 2008 election made the Communist Party of Nepal (Maoist) as the largest party of the country. A federal republic was established in May 2008, with only four members of the 601-seat Constituent Assembly voting against the change, which ended 240 years of royal rule in Nepal. The government announced a public holiday for three days (May 28-May 30), to celebrate the country becoming a federal republic.

## I. The Prime Ministers of Nepal

The position of Prime Minister of Nepal in modern form was called by different names at different times of Nepalese history. Since the inception of the Shah dynasty, the Mul-Kajis served the function of Prime Ministers. In 1806, the position of Mukhtiyar was created by the King Rana Bahadur Shah, and the title was subsequently adopted. 'Mukhtiyar' is formed from two words: 'Mukhya' and 'Akhtiyar'. Mukhya means Chief and Akhtiyar means Authority. Mukhtiyar Bhimsen Thapa was the first person to be referred to as Prime Minister of Nepal by the British.

Few of Nepalese Prime Ministers have carried a democratic mandate. The first elected Prime Minister was Bishweshwar Prasad Koirala, in 1959. After he was deposed and imprisoned, Nepal did not have a democratic government until 1990, when the country became a constitutional monarchy. The monarchy was abolished on 15<sup>th</sup> of Jestha, 2065 by the Constituent Assembly.

### Prime Ministers during the Absolute Monarchy (1799-1990)

#### Mul-Kajis during the Shah Expansion Era (1799-1804)

S.N	Name (Birth-Death)	Term at Office	Political Party
1	Damodar Pande (1752-1804)	1799-1804	Nonpartisan

#### Mukhtiyars during the Thapa/Pande Era (1806-1846)

2	Bhimsen Thapa (1775-1839)	1806-1837	Nonpartisan
3	Rana Jung Pande (1789-1843)	1837-1837	Nonpartisan
4	Ranga Nath Poudyal (1773- ?)	1837-1838	Nonpartisan
5	Chautariya Puskar Shah (1784-1846)	1838-1839	Nonpartisan
(3)	Rana Jung Pande (1789-1843)	1839-1840	Nonpartisan
(4)	Ranga Nath Poudyal (1773- ?)	1840-1840	Nonpartisan
6	Fateh Jung Shah (1805-1846)	1840-1843	Nonpartisan
7	Mathabar Singh Thapa (1798-1845)	1843-1845	Nonpartisan
(6)	Fateh Jung Shah (1805-1846)	1845-1846	Nonpartisan

#### Prime Ministers during the Rana Era (1846-1951)

8	Jung Bahadur Rana (1816-1877)	1846-1856	Nonpartisan
9	Bam Bahadur Kunwar Rana (1818-1857)	1856-1857	Nonpartisan
-	Krishna Bahadur Kunwar Rana (1823-1863)	1857-1857	Nonpartisan
(8)	Jung Bahadur Rana (1816-1877)	1857-1877	Nonpartisan

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10	Ranodip Singh Kunwar (1825-1885)	1877-1885	Nonpartisan
11	Bir Shumsher JBR (1852-1901)	1885-1901	Nonpartisan
12	Dev Shumsher JBR (1862-1914)	1901-1901	Nonpartisan
13	Chandra Shumsher JBR (1863-1929)	1901-1929	Nonpartisan
14	Bhim Shumsher JBR (1865-1932)	1929-1932	Nonpartisan
15	Juddha Shumsher JBR (1875-1952)	1932-1945	Nonpartisan
16	Padma Shumsher JBR (1882-1961)	1945-1948	Nonpartisan
17	Mohan Shumsher JBR (1885-1967)	1948-1951	Nonpartisan

**Prime Ministers during the Transition Era (1951-1960)**

18	Matrika Prasad Koirala (1912-1997)	1951-1952	Nepali Congress
-	Direct Rule by King Tribhuvan (1906-1995)	1952-1953	
(18)	Matrika Prasad Koirala (1912-1997)	1953-1955	Rastriya Praja Party
-	Direct Rule by King Mahendra (1920-1972)	1955-1956	
19	Tanka Prasad Acharya (1912-1992)	1956-1957	Nepal Praja Parisad
20	Kunwar Inderjit Singh (1906-1982)	1957-1958	Unified Democratic
21	Subarna Shamsheer Rana (1910-1977)	1958-1959	Nepali Congress
22	Bishweshwar Prasad Koirala (1914-1982)	1959-1960	Nepali Congress

**Prime Ministers during the Panchayat era (1960-1990)**

23	Tulsi Giri (1926-)	1960-1963	Nonpartisan
24	Surya Bahadur Thapa (1928-2015)	1963-1964	Nonpartisan
(23)	Tulsi Giri (1926-)	1964-1965	Nonpartisan
(24)	Surya Bahadur Thapa (1928-2015)	1965-1969	Nonpartisan
25	Kirti Nidhi Bista (1927-)	1969-1970	Nonpartisan
-	Gehendra Bahadur Rajbhandari (1923-)	1970-1971	Nonpartisan
(25)	Kirti Nidhi Bista (1927-)	1971-1973	Nonpartisan
26	Nagendra Prasad Rijal (1927-1994)	1973-1975	Nonpartisan
(23)	Tulsi Giri (1926-)	1975-1977	Nonpartisan
(25)	Kirti Nidhi Bista (1927-)	1977-1979	Nonpartisan
(24)	Surya Bahadur Thapa (1928-2015)	1979-1983	Nonpartisan
27	Lokendra Bahadur Chand (1940-)	1983-1986	Nonpartisan
(26)	Nagendra Prasad Rijal (1927-1994)	1986-1986	Nonpartisan
28	Marich Man Singh Shrestha (1942-2013)	1986-1990	Nonpartisan
(27)	Lokendra Bahadur Chand (1940-)	1990-1990	Nonpartisan

**Prime Minister during the Constitutional Monarchy (1990-2008)**

S.N.	Name (Birth-Death)	Term at Office (Days)	Political Party
29	Krishna Prasad Bhattarai (1924-2011)	1990-1991 (402 Days)	Nepali Congress
30	Girija Prasad Koirala (1925-2010)	1991-1994 (1284 Days)	Nepali Congress
31	Man Mohan Adhikari (1920-1999)	1994-1995 (286 Days)	CPN-UML
32	Sher Bahadur Deuba (1946-)	1995-1997 (547 Days)	Nepali Congress
(27)	Lokendra Bahadur Chand (1940-)	1997-1997 (209 Days)	Rastriya Prajatantra Party
(24)	Surya Bahadur Thapa (1928-2015)	1997-1998 (190 Days)	Rastriya Prajatantra Party
(30)	Girija Prasad Koirala (1925-2010)	1998-1999 (411 Days)	Nepali Congress
(29)	Krishna Prasad Bhattarai (1924-2011)	1999-2000 (296 Days)	Nepali Congress
(30)	Girija Prasad Koirala (1925-2010)	2000-2001 (491 Days)	Nepali Congress
(32)	Sher Bahadur Deuba (1946-)	2001-2002 (435 Days)	Nepali Congress
-	Direct Rule by King Gyanendra (1947-)	2002-2002 (7 Days)	-
(27)	Lokendra Bahadur Chand (1940-)	2002-2003 (237 Days)	Rastriya Prajatantra Party
(24)	Surya Bahadur Thapa (1928-2015)	2003-2004 (364 Days)	Rastriya Prajatantra Party
(32)	Sher Bahadur Deuba (1946-)	2004-2005 (243 Days)	NC Democratic
-	Direct Rule by King Gyanendra	2005-2006 (448 Days)	-
(30)	Girija Prasad Koirala (1925-2010)	2006-2008 (764 Days)	Nepali Congress

**Prime Ministers of Federal Democratic Republic of Nepal (2008-Present)**

(30)	Girija Prasad Koirala (1925-2010)	2008-2008 (83 Days)	Nepali Congress
33	Puspa Kamal Dahal (1954-)	2008-2009 (280 Days)	UCPN- Maoist
34	Madhav Kumar Nepal (1953-)	2009-2011 (622 Days)	CPN-UML
35	Jhala Nath Khanal (1950-)	2011-2011 (204 Days)	CPN-UML
36	Baburam Bhattarai (1954-)	2011-2013 (563 Days)	UCPN- Maoist
-	Khil Raj Regmi (1949-)	2013-2014 (334 Days)	Nonpartisan
37	Sushil Koirala (1939-2016)	2014-2015 (608 Days)	Nepali Congress
38	Khadga Pd. Sharma Oli (1952-)	2015-Present	CPN-UML

**J. Questionnaire**

1. Which ancient civilization is the product of Nile River? – Ancient civilization of Nile River
2. When was the First World War started? – July 28<sup>th</sup>, 1914
3. Which country was first attacked by which in the First World War? – Austria over Siberia
4. Which country was first attacked in the Second World War by German? – Poland
5. What were the symbolic names of the bombs dropped on Hiroshima and Nagasaki? – Little boy and Fat man
6. When did America drop bomb in Hiroshima, Japan? – August 6<sup>th</sup>, 1945
7. When did feudal system end in China? – 1911 AD
8. Where was the capital city of England before the present London? – Manchester
9. Who was the emperor of Mugal? – Babar
10. Which King of France Is called public King? – Lui Philip
11. Who had first translated Bible in German Language? – Martine Luther
12. Who was the leader of the successful cultural revolution of China? – Mao
13. Where was the industrial revolution started from? – England
14. Who is the founder of Scout? – Robert Waden Pawel
15. Who is the founder of Red Cross? – Dr. Henry Dyuna
16. Who was the blind greatest poet of Greece? – Homer
17. When did Israel take Palestine under its control? – 1969 AD
18. Who was the famous builder of Eiffel Tower of Paris? – Alexander Gustav Eiffel
19. Who is known as the founder of public Administration? – Wildro Wilson
20. Who was the first General Secretary of UN? – Tigwelly (Norway)
21. Who is known as the mad King of England? – George III
22. What is the next name of Chinese civilization? – Hwang Ho
23. Which is the oldest civilization of the world? – Chinese Civilization
24. Where is the source of Nile River? – Hilly area of Ethiopia
25. In which bank of river civilization of Mesopotamia had developed? – Tikrig and Yukrates river (Iraq)
26. What is the present name of Mesopotamia? – Iraq, Turkey, Syria, Israel and Lebanon
27. What is the ancient Greek Civilization also called? – Yunnan Civilization
28. Who is known as the father of History? – Herodotus

29. Who built Great Wall of China? – Saiset Huwang
30. Who integrated Germany? – Bismarck
31. Who is regarded to be the first person to start the concept of German nationalism? – Napoleon Bonaparte
32. When did British Revolution occur? – 1688 BC
33. Who were the main writers of Renaissance Period? – Dante, Shakespeare, Milton & Geoffrey Chaucer
34. Which period is known as the period of travel and search? - Renaissance Period
35. When did German surrender? – 7<sup>th</sup> May, 1945
36. When was American freedom announced? – 4<sup>th</sup> July, 1776
37. On which war was Napoleon defeated? – War of Waterloo
38. When was UNO established? – 24<sup>th</sup> Oct, 1945
39. Where is the Pyramid of Egypt? – Giza
40. When did Bikram Sambhat start? – 58 BC
41. Who is the first and only one lady Prime Minister of Britain? – Mrs. Margaret Thatcher
42. Who is the first President of America to be killed in his period? – Abraham Lincoln
43. Who was the President of Britain who received the Nobel Prize in Literature? – Winston Churchill
44. When did British people reach India? – 1600 AD
45. Who is the first President of Independent India? – Mahatma Gandhi
46. Who was the first Prime Minister of Independent India? – Jawaharlal Nehru
47. What was the full name of Mahatma Gandhi? – Mohan Das Karmachanda Gandhi
48. Who killed Mahatma Gandhi? – Nathuram Godse
49. Who is the composer of the national song of India and Bangladesh? – Rabindranath Tagore
50. Whose armies were killed in highest number in the First World War? – Germany
51. In which place was treaty done to end the First World War? – Versailles
52. Who was the ruler of Germany during Second World War? – Hitler
53. Who was the ruler of Italy during Second World War? – Mussolini
54. Who was the person to wear only black dress during his lifetime? – Mussolini
55. What is said to the flag of Britain? – Union Jack
56. What do 50 stars of American flag indicate? – 50 Kingdom
57. What is included in the flag on India? – Ashok Chakra



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58. Who is known as the light of Asia? – Gautam Buddha
59. Who is known as the light of World? – Jesus Christ
60. Who is known as the Lady with the Lamp? – Florence Nightingale
61. Who is known as the Man of Blood and Iron? – Bismarck
62. Who is known as the Man of Density? – Napoleon Bonaparte
63. Who is known as the Father of India? – Mahatma Gandhi
64. Who is known as the Iron Lady? – Margaret Thatcher
65. Who is known as Father of English Poetry? – Geoffrey Chaucer
66. Whose sub name is Harrit Tara? – Bhrikuti
67. Who is known as the magician of football? – Pele
68. Who is known as the Man of Peace? – Lal Bahadur Shastri
69. Who is known as the World Poet? – Rabindranath Tagore
70. When did India set a world record by sending 10 satellites into orbit in a single launch? – 28<sup>th</sup> April, 2008
71. Who is the first black president of America? – Barack Obama
72. When was Barack Obama elected as the president of America? – November, 2008
73. When did Barack Obama take oath of the president post? – 20<sup>th</sup> January, 2009
74. When was Osama Bin Laden killed? – 2<sup>nd</sup> May, 2011
75. Which is the 193<sup>rd</sup> independent country in the world? – South Sudan(9<sup>th</sup> July, 2011)
76. What is the capital of South Sudan? – Juba
77. When was Gaddafi of Libya killed? – 20<sup>th</sup> October, 2011
78. How many seats did Indian People's Party won in the 16<sup>th</sup> Legislative Election out of 543 seats? – 282 seats
79. Who is the 16<sup>th</sup> Prime Minister of independent India? – Narendra Damodardas Modi
80. When did Narendra Modi appointed for the Prime Minister by the Indian President Pranab Mukhari? – 20<sup>th</sup> May, 2014 (He took oath on 26<sup>th</sup> May)
81. When did Bhutan hold first ever general election? – 24<sup>th</sup> March, 2008
82. When did the execution of Saddam Hussein take place? – 30<sup>th</sup> December, 2006
83. Who is the discoverer of Solar system? – Copernicus (Poland)
84. Who is regarded to be the founder of India? – Vasco Di Gamma (Portugal)
85. Who found America? – Columbus (Italy)
86. Which is the country where highest number of accidents takes place? – Indonesia
87. Which is the country where highest numbers of sunflower are grown? – Russia

88. Which is the country where highest numbers of waterfalls are found? – Canada
89. Which is the country producing highest amount of wool? – Australia
90. Which dynasty ruled for the first time in Nepal? – Gopal
91. Who was the first King of Nepal? – Dharmakar
92. During which Kiranti King's period had Gautam Buddha traveled the Valley? – Jeetedasti
93. Who was the first king of Kirant Dynasty? – Yalamber
94. During which Kiranti King's period had Samrat Ashoka come Nepal? – Sthunkoko
95. In which script Ashoka Pillar written? – Pali (Brahmi) Script
96. Who is regarded as the first Lichchhavi King? – Jayadev I
97. From where had Lichchhavis come to Nepal? – Baishali, India
98. Who is known as the historical King of Nepal? – Manadev
99. Who started the word 'Majesty'? – Anshuvarma
100. Which ruling period is known as the Nepal's Golden Period? – Lichchhavi
101. Who used to rule in Tibet during Anshuvarma's Period? – Shranchan Gampo
102. What was Anshuvarma's daughter name? – Bhrikuti
103. Who used to rule in India during Anshuvarma's Period? – Harshabardan
104. Who started the culture of worshipping Kumari? – Gunakamdev
105. Who had established Khas State in Karnali? – Nagraj Krachalla
106. Who divided Nepal into 4 castes and 36 sub castes? – Jayasthiti Malla
107. Where was the capital of Khas state in Karnali? – Sinja
108. Which Malla King did not eat food until the smoke rose from the every house? – Mahindra Malla
109. Which King used to leave food at the death of his citizen? – Mahindra Malla
110. Which king introduced the use of silver coin? – Mahindra Malla
111. Who is known as the 'Simsime' King? – Shivasingh Nalla
112. Who imprisoned his own father and became King? – Pratap Malla
113. Which Malla King is believed to be alive till today? – Yog Narendra Malla
114. Who was the last Malla king of Kathmandu? – Jay Prajash Malla
115. Who introduced the system of Gaijatra? – Pratap Malla
116. Who are the persons on elephant in statue in Ranipokhari? – King Pratap Malla, his son and Queen
117. Who established Sen Dynastry in Palpa? – Rudra Sen
118. When was Gorkha Kingdom established? – 1616 BS
119. Who was the first king to achieve Shah Title? – Kulmandan Khan

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120. Who managed Mana, Pathi, Dhak, Taraju, Muri and weight? – Ram Shah
121. When was Prithvi Narayan Shah born? – 27<sup>th</sup> Poush, 1779 BS
122. When did Prithvi Narayan Shah attack Nuwakot for the first time? – 1800 BS
123. When did Prithvi Narayan Shah attack Kritipur for the first time? – 1814 BS
124. When Prithvi Narayan Shah did become King? – 1799
125. When was Kaji Kalu Pandey killed? – On the attack of Kritipur in 1814 BS
126. When did Prithvi Narayan Shah died? – 1<sup>st</sup> Magh, 1831 BS (Devighat, Nuwakot)
127. Who was Bahadur Shah? – Youngest son of PN Shah
128. Who was the eldest son of PN Shah? – Pratap Singh Shah
129. Who is regarded as the first PM of Nepal? – Bhimsen Thapa
130. What is the next name of Dharahara of Kathmandu? – Bhimsen Stambha
131. Who was the person to become Prime Minister up to three King's Period? – Bhimsen Thapa (ruled for 31 years)
132. Who was the person to become Nepal's King in the youngest age? – Girvanyuddha Bikram Shah
133. When did Nepal-Tibet war end under the mediation of China? – 1849 BS
134. Who was the King of Nepal during Anglo-Nepal war? - Girvanyuddha Bikram Shah
135. Who was the PM of Nepal during Anglo-Nepal war? – Bhimsen Thapa
136. Who started the tradition of using Golden coins? – Rana Bahadur Shah
137. Who was the King of Nepal during Sugauli Treaty? – Surendra Bikram Shah
138. Who was the PM of Nepal during Sugauli Treaty? – Bhimsen Thapa
139. What was the main reason of the battle between Nepal and British? – Dispute of territory of Syuraj and Butwal
140. When Court Massacre (Kot Parva) did take place? – 2<sup>nd</sup> Aswin, 1903 BS
141. When the first Rana PM of Nepal Jung Bahadur Rana did announced himself as Shree 3? – 1913 BS
142. Who was known as the first Martyr of Nepal? – Lakhan Thapa
143. Who started 'Charkha Pracharak' campaign? – Tulsi Mehar Shrestha
144. On whose period did first Nepali Calendar published in Nepal? – Ranodip Singh
145. Who is known as 'Dhankute King'? – Dev Shumsher
146. When was Tri-Chandra College established? – 1978 BS
147. Who said 'I am the servant of my nation'? – Padma Shumsher
148. Who was the King to start Muluki Ain? – Surendra Shah
149. When was paper money started in Nepal? – 1990 BS
150. When were four martyr of Nepal given death penalty? – 1997 BS

151. When did Democracy established in Nepal? – 7<sup>th</sup> Falgun, 2007
152. Who is the first PM of the elected government of Nepal? – Bishweswor Prasad Koirala
153. When did the Kantipur daily start its publication? – Falgun 7<sup>th</sup>, 2049 B.S
154. Which country had been visited for the first time by Nepal's first president Dr Rambaran Yadav? – India
155. What was the name of Kathmandu valley in the Malla period? – Nepal Mandal
156. When did Nepal-India Gandak Treaty signed? – 2016 B.S.
157. Who was the Prime Minister of Nepal during First World War? – Chandra Shumsher
158. From when did Nepali Language become official language? – Baisakh 2<sup>nd</sup>, 2021 B.S.
159. Which is the first mobile company in Nepal? – Dursanchar Sanstan
160. When did postal service start for the first time in Nepal? – 1935 B.S.
161. When did the airplane land for the first time in Nepal? – Baisakh 11<sup>th</sup>, 2007 B.S.
162. Who prepared valley for settlement? – Manju Shree
163. What was the national language in the Lichchhavi period? – Sanskrit
164. Who was the first PM from Public? – Matrika Prasad Koirala
165. Who is known as the living Martyr of Nepal? – Tanka Prasad Acharya
166. When did first general election held? – 7<sup>th</sup> Falgun, 2015
167. When was Referendum system announced? – 2036
168. When did Referendum system take place? – 20<sup>th</sup> Baisakh, 2037
169. When was Mass Revolution of 2046 started? – 7<sup>th</sup> Falgun, 2046
170. When was Dasdhunga Massacre occurred? – 3<sup>rd</sup> Jestha, 2050
171. Who were killed in Dasdhunga Massacre? – CPN UML Leaders: Madan Bhandari and Jivlal Ashrit
172. When was Royal Palace opened for the first time for Public after 2046? – 1<sup>st</sup> Kartik, 2050 BS
173. When was constitution of 2046 announced? – 23<sup>rd</sup> Kartik, 2047
174. When did Royal Massacre take place in the history of Nepal? – 19<sup>th</sup> Jestha, 2058
175. When did Shah Dynasty come to an end formally from Nepal? – 29<sup>th</sup> Jestha, 2065 BS
176. Who was the last King of Nepal? – Gyanendra Shah
177. Who placed the flag of citizens in Narayanhiti Palace? – The then PM Girija Prasad Koirala
178. When did the election held for the first President of Republic Nepal?- 6<sup>th</sup> Shrawan, 2065
179. When did Republic established in Nepal? – 15<sup>th</sup> Jestha, 2064
180. Whose poem was chosen as the National Anthem of Nepal by National Anthem Selection Commission 2063? – Byakul Maila (Pradip Kumar Rai)

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## Music and Entertainment

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Music is the art of arrangement of sounds or vocal to produce a continuous, unified, and evocative composition, as through melody, harmony, rhythm, and timbre. Its common elements are pitch (which governs melody and harmony), rhythm, dynamics, and the sonic qualities of timbre and texture.

The creation, performance, significance, and even the definition of music vary according to culture and social context. Music can be divided into genres and subgenres, although the dividing lines and relationships between music genres are often subtle, sometimes open to personal interpretation, and occasionally controversial. Within the arts, music may be classified as a performing art, a fine art, and auditory art. It may also be divided among art music and folk music. Music may be played and heard live, may be part of a dramatic work or film, or may be recorded. To many people in many cultures, music is an important part of their way of life. A 20th-century composer John Cage thought that any sound can be music, saying as ‘There is no noise, only sound.’

## A. Music and Songs

### Musical Terms

Many musical terms are derived from Italian words. Here are the meanings of some common ones.

<b>Term</b>	<b>Meaning</b>
Agitato	Agitated or excited
Brillante	Sparkling, brilliant
Brio	Spirit or vigor
Crescendo	Gradual increase in volume
Dolce	Sweet, soft and gentle
Dolente	Sad
Forte	Loud or strong
Fortissimo	Very loud
Grave	Slow and serious
Legato	Smoothly and evenly
Molto	Much or very
Pianissimo	Very soft
Piano	Soft
Ritenuato	Slowing and tempo
Scherzo	Lively
Sotto voce	Quiet and subdued
Tutti	All the players

### Famous Songs

**Auld Lang Syne:** The word of this song comes from verses written by Scottish Poet Robert Burns in 1788. The music is based on an old ballad. 'Auld Lang Syne' (meaning old long since) is traditionally sung at midnight on New Year's Eve, except in Taiwan where it is a graduation song.

**Happy Birthday to You:** In 1893 two American sisters, who were teachers, wrote this song to sing in school assemblies. Mildred J. and Patty Smith Hill originally called the song 'Good Morning to you'. After the words were changed in 1924, it became known the world over.

**Waltzing Matilda:** Waltzing Matilda has been described as Australia's unofficial national anthem. The song was written in Australia's unofficial national anthem. The

song was written in Australia in 1895 by Andrew Barton Paterson. The music is by Christina Macpherson and is based on a traditional Scottish song.

### Top albums of all the time Worldwide

The USA has always led the world in album sales. Total worldwide sales are less easy to find, but using the best estimates available these albums can claim to be world beaters.

#### Artists/albums/year

1. Michael Jackson, Thriller (1982)
2. Pink Floyd, Dark Side of The Moon (1973)
3. Whitney Houston, The Bodyguard (1992)
4. Eagles, Their Greatest Hits (1976)
5. AC/DC, Back in Black (1980)
6. Bee Gees, Saturday Night Fever (1977)
7. Fleetwood Mac, Rumours (1977)

### Popular Dances

**Barn dances:** These developed from traditional Scottish dancing. They were popular in the USA in the 1890s when they were held to celebrate the building of a barn on a farm. Barn dances are still held today in country areas.

**Belly dance:** The popular name of a style of dance that originated in the Middle East, especially Egypt. It was originally danced only by women and men were not permitted to watch. An Essex woman named Eileen Foucher set a belly dance record. She danced for 106 hours, from 30 July to August 1984.

**Break dance:** Break dancing began in New York in the late 1970s and early 1980s. Some of its movements came from martial arts such as kung fu and from gymnastics. It became a feature of hip-hop culture.

**The Charleston:** The Charleston was named after the city in South Carolina, USA and was one of the most popular dances of the 1920s.

**The Conga:** People dance the conga in a line, each dancer holding on to the person in front. The conga began in Latin American carnivals and spread to the USA in the 1930s. The Miami Super Conga was held on 13 March 1988.

**Morris dancing:** This is a traditional English folk dance. Dancers wear special costumes with bells and hold sticks, handkerchiefs and swords.

## B. Music Industry

The music industry consists of the companies and individuals that make money by creating and selling live music performances, sound recordings and music videos of songs and instrumental pieces. Among the many individuals and organizations that operate in the industry are: the songwriters and composers who create new music; the singers, musicians, conductors and bandleaders who perform the music; the companies and professionals who create and sell recorded music and sheet music (e.g., music publishers, producers, recording studios, engineers, record labels, retail and online music stores, performance rights organizations); and those that help organize and present live music performances (booking agents, promoters, music venues, road crew).

The industry also includes professionals who assist singers and musicians with their music careers (talent managers, artists and repertoire managers, business managers, entertainment lawyers); those who broadcast music (satellite, Internet radio stations, broadcast radio and TV stations); music journalists and music critics; music educators and teachers; musical instrument manufacturers; as well as many others.

### Grammy Award



The Grammy Award is awarded for outstanding achievements in the music industry by the National Academy of Recording Arts and Sciences (NARAS) of the United States. It is originally called Gramophone Award. The annual presentation ceremony features performances by prominent artists, and the presentation of those awards that have a more popular interest. It shares recognition of the music industry as that of the other performance awards such as the Emmy Awards (television), the

Tony Awards (stage performance), and the Academy Awards (motion pictures). The first Grammy Awards ceremony was held on May 4, 1959, to honor the musical accomplishments by performers for the year 1958.

#### Grammy Award of the Year:

The general field is four awards which are not restricted by genre. 'Album of the Year' is awarded to the performer and the production team of a full album. 'Record of the Year' is awarded to the performer and the production team of a single song. 'Song of the Year' is awarded to the writer/composer of a single song. 'Best New Artist' is



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awarded to a promising breakthrough performer who releases, during the Eligibility Year, the first recording that establishes the public identity of that artist (which is not necessarily their first proper release).

<b>Year</b>	<b>Album of the Year</b>	<b>Record of the Year</b>	<b>Song of the Year</b>	<b>Best New Artist</b>
2000	Supernatural	Smooth	Smooth	Christina Aguilera
2001	Two Against Nature	Beautiful Day	Beautiful Day	Shelby Lynne
2002	O Brother, Where Art Thou?	Walk on	Fallin	Alicia Keys
2003	Come Away With Me	Don't Know Why	Don't Know Why	Norah Jones
2004	Speakerboxxx/ The Love Below	Clocks	Dance With My Father	Evanescence
2005	Genius Loves Company	Here We Go Again	Daughter	Maroon 5
2006	How to Dismantle an Atomic Bomb	Boulevard of Broken Dreams	Sometimes You Can't Make It on Your Own	John Legend
2007	Taking the Long Way	Not Ready to Make Nice	Not ready to Make Nice	Carrie Underwood
2008	River: The Joni Letters	Rehab	Rehab	Amy Winehouse
2009	Raising Sand	Please Read the Letter	Viva la Vida	Adele
2010	Fearless	Use Somebody	Single Ladies (Put a Ring on It)	Zac Brown Band
2011	The Suburbs	Need You Now	Need You Now	Esperanza Spalding
2012	21	Rolling in the Deep	Rolling in the Deep	Bon Iver
2013	Babel	Somebody That I Used To Know	We are Young	Fun
2014	Random Access Memories	Get Lucky	Royals	Macklemore & Ryan Lewis
2015	Morning Phase	Stay with Me	Stay with Me	Sam smith
2016	1989	Uptown Funk	Thinking Out Loud	Megan Trainor

## C. Instruments of the Orchestra

An orchestra is a group of musicians playing instruments together called a large instrumental ensemble. They usually play classical music. A large orchestra is sometimes called a symphony orchestra and a small orchestra is called a chamber orchestra. A symphony orchestra may have about 100 players, while a chamber orchestra may have 30 or 40 players. The instruments of the orchestra are divided into districts: bowed strings, woodwind, brass, percussion, keyboard, and the guitar family, the first four of which form the basis of the modern symphony orchestra.

### Bowed Strings

The four principle orchestral string instruments are the violins, the violas, the violoncellos and the double basses. Each have four strings arranged in order of pitch that can be played by means of a bow or plucked, but the violin and viola are played with the instrument resting between the shoulder and the chin, the larger cello is placed facing outwards between and slightly behind the knees and the bulky double bass is played standing up or seated on a high stool.

The violin has a hollow wooden body which resonates when the violinist pulls a bow over the four strings. The viola is larger and deeper voiced than the violin and is played in the same way as violin. The cello is third largest member of the violin family and it is played sitting down. The largest and deepest stringed instrument in an orchestra is the double bass.



### Woodwinds

The four principle woodwind instruments of the orchestra, all work by means of a system of keys (usually silver-plated) which when variously depressed and released allow air to pass through differing lengths of the instrument resulting in notes of different pitch. In order of descending overall pitch, these are:

**Flute:** It is normally silver-plated, narrow-bored instrument held horizontally just under the mouth and activated by blowing air across an aperture at one end of the instrument. Alto and bass flutes are larger versions which play lower notes. The piccolo is half the size of the concert flute and plays the highest notes in the orchestra.





**Oboe:** It is a narrow-bored wooden instrument descended from the medieval shawm, held vertically and activated by means of placing the end-positioned double-reed in the mouth, and blowing under high-pressure so as to force air between the two bound reeds causing them to vibrate. Other members of the oboe family include the lower pitched cor anglais (or English horn) and (far more rarely) baritone oboe and heckle phone (bass oboe).

**Clarinet:** Like the oboe it is also usually wooden, played vertically and held in the mouth but with a wider bore consisting of a single reed which when activated vibrates against a detachable mouthpiece. The standard instrument can be pitched in B flat or A. The family is unusually extensive including the higher-pitched E flat, the B flat bass, the rarely-used C, the alto and the even more obscure double-bass or pedal clarinet. Occasionally the clarinet's popular cousin can be seen in the concert hall, the saxophone.



**Bassoon:** The bassoon plays the lowest notes of the woodwind instruments. Like the oboe, it is a double-reed wooden tube, although to facilitate the playing action, it is connected to the bassoon via a silver-plated curved crook. Its most notorious cousin is the Baroque serpent, shaped very much as its name would suggest.

### Brass instruments

Brass instruments are also activated by blowing air into them, instead of using a form of reed over which the mouth is placed; the lips are placed against or inside the cup of a metal mouthpiece and made to vibrate against its inner rim. In order of descending pitch, these are:

**Trumpet:** It is one of the most ancient of all instruments which is played horizontally via a series of valves on the top of the instrument which are opened and closed in various combinations. Occasionally, the piccolo (higher) or bass (lower) trumpets are heard. The trumpet is a tightly coiled metal tube with a cone called the bell at one end. Trumpets have three small buttons called valves which make different notes when pressed.





**French Horn:** It is another ancient instrument descended from the use of animals' horns in pre-historic times. The modern instrument is the most outwardly complex consisting of a basic tube, rounded into a compact shape culminating in a conical bore or bell into which a series of valves are centrally set. Before the valve system had been developed, the changing of basic pitch was facilitated by the insertion of a variety of crooks. French horn players make different notes by changing the shape of their lips as they blow into the mouthpiece of this coiled metal tube.



**Tuba:** There is usually just one tuba in an orchestra. It plays the lowest notes of all the brass instruments. The piston valve action is similar to the trumpet, only the valves themselves are situated in the middle of the instrument.

### Percussion instruments

A percussion instrument is probably best defined as one where a resonating surface is struck or scraped by the player either by hand or by some form of stick. These divide roughly into tuned instruments which have a definite pitch or series of pitches and those of indefinite pitch. The percussion family is believed to include the oldest musical instruments, following the human voice. The percussion section of an orchestra most commonly contains instruments such as timpani, snare drum, bass drum, cymbals, triangle and tambourine.



**Timpani:** Timpani are musical instruments in the percussion family. A type of drum consists of a skin called a head stretched over a large bowl traditionally made of copper. They are played by striking the head with a specialized drum stick called a timpani stick or timpani mallet. Timpani evolved from military drums to become a staple of the classical orchestra by the last third of the 18th century. Today, they are used in many types of musical ensembles, including concert bands, marching bands, orchestras, and even in some rock.

### Keyboard instruments

A keyboard instrument is a musical instrument played using a keyboard. The most common of these are the piano, organ, and various electronic keyboards, including synthesizers and digital pianos. Other keyboard instruments include celestas, which are struck idiophones operated by a keyboard, and carillons, which are usually used in bell towers or belfries of churches or municipal buildings.



**Piano:** The piano is a musical instrument played using a keyboard developed in 18<sup>th</sup> century, which is a row of keys that the performer presses down or strikes with the fingers and thumbs of both hands. The piano is widely employed in classical, jazz, traditional and popular music for solo and ensemble performances, accompaniment, and for composing and rehearsal.

### Electronic instruments

An electronic musical instrument produces sound using electronics. It might include a user interface for controlling its sound, often by adjusting the pitch, frequency, or duration of each note. It can also be viewed as a subset of audio signal processing applications. Simple electronic musical instruments are sometimes called sound effects. Electronic musical instruments are now widely used in most styles of music.

**Guitar family:** The classical guitar is typically a Spanish derived, six stringed instruments played using a plectrum or the finger nails with frets set into the fingerboard. Popular music tends to use amplification for both six stringed instruments and the four string bass guitar. The guitar family gradually supplanted the lute which had come to prominence during the Renaissance.



## D. Famous Singers of Nepal

### Ani Choying Dolma

Ani Choying Dolma was born on May 17, 1970 in Kathmandu. She is also known as Choying Dolma and Ani Choying. She is a Buddhist nun and musician from the Nagi Gumpa. She is well known in Nepal and throughout the world for bringing many Tibetan Buddhist chants and feast songs to mainstream audiences. She entered monastic life as a means of escape from her physically abusive father, and she was accepted into the Nagi Gumpa nunnery at the age of 13. For a number of years, the monastery's resident chant master (who was trained directly by the wife of Tulku Urygen Rinpoche) taught Ani Choying the music that she is famous for performing.

In 1994, guitarist Steve Tibbetts visited the nunnery and eventually recorded much of the Tibetan music with Ani Choying on two albums. The recordings, titled Chö and Selwa, were released to critical acclaim. Tibbetts and Ani Choying embarked on small performance tours, which included shows at several historical Tibetan monasteries. Sina Vodjani also recorded an album in collaboration with Ani Choying Dolma. She is a part of a fairly large group of musicians in the Tibetan tradition, including singer Techung, singer Karjam Saeji, singer Phurbu T Namgyal, flautist Nawang Khechog, singer Amchok Gompo Dhondup, singer Yungchen Lhamo and Jewish-American Tibetan-genre performer Amalia Rubin.

She had included her whole life of struggle in a book titled 'Phoolko Akhama'. This Book is published in more than 12 languages. It was first published in French by Oh! Editions

Discography: Chö (1997), Dancing Dakini (1999), Choying (2000), Moments Of Bliss (2004), Selwa (2004), Smile (2005), Inner Peace (2006), Ama (2009), Matakala (2009), Inner Peace 2 (2011), Zariya - Ani, A R Rahman, Farah Siraj - Coke Studio at MTV

### Karna Das

Karna Das is one of the most prominent Nepali singers. He was born on 24 September, 1974 in Pokhara. Das completed high school in 1993 and studied economics in college. Das was also the lead singer of the band Madhyanha. He started his singing career in 1997 with the first song 'Jindagi Ko Ke Bharosa'. Mr. Das plays piano. He is inspired by Elton Jones, Richard Michael, Lata Mangeshkar, Jagjit Singh of India and Narayan Gopal of Nepal. He enjoys performing in front of large audiences. He strongly believes his mother is almighty. Most of his songs are heart touching and have high emotion.

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Discography: Madhyanha - 1(1997), Madhyanha - 2(1998), Madhyanha - 3(2001), Byerthai fer(2000), Purano Dunga(2003), Aadha Sapana(2005), Preet(2007)

### **Ram Krishna Dhakal**

Ram Krishna Dhakal was born on July 23, 1974. He is a famous modern, pop, playback singer, actor and reality show judge from Nepal. He is married to Neelam Shah. They have a daughter named Rani Dhakal. He was discovered at an early age by Arjun Pokwal.

Ram Krishna Dhakal started his musical career early in his childhood when he covered popular songs by another prominent singer of Nepal, Narayan Gopal. During his early period, he struggled singing amongst his group but he soon broke out into national attention and ultimately established himself as one of the most popular Nepalese artist. He rose to fame with his song Orali lageko harin ko chhal bho. As a small kid, he used to sing at social functions and events. People were impressed by his singing ability and voice. He modeled his singing style after Narayan Gopal; Dhakal acknowledges that he is a big fan of the late maestro. It would be fair to say that he benefited from the void left by Narayan Gopal's death. People were looking for someone to fill the void. In fact, they were looking for the next Narayan Gopal and the next Narayan Gopal was Ram Krishna Dhakal. But he was able to make his album and be a popular singer because of his father Gopal Karmacharya.

He appeared in the movie Aashirbad in the lead role. It is said that the story of movie was based or inspired by his own personal story of struggle and his rise to fame. It was a successful film, partly aided by good music. He has released 10 albums of modern songs and ghazals. He has sung nearly 1000 songs. Apart from adhunik geet (modern song), he has also sung bhajans, patriotic songs and many film songs. He is one of the most popular singers in Nepal.

Discography: Aashirbad, Aashish, Asha, Aroha, Aashraye, Aagraha, Aadhar, Aashraya, Aagaman, Mero Saathi, Shaili

### **Narayan Gopal**

Narayan Gopal Guruacharya was born on October 4, 1939(18 Asoj, 1996 B.S.) into a Newar family in Kilagal Tole, Kathmandu to father Ram Gopal Guruacharya and mother Asha Devi Guruacharya. He is the most prominent and popular singer and composer in the history of Nepali music. He is popularly referred as 'Swar Samrat', meaning emperor of voice in Nepali music. He is also known as Tragedy King. He is well known as a singer as well as a composer. His voice range allowed him to sing songs of every genre of Nepali music. His songs are often richly orchestrated with the

sitar, harmonium and flute. He belongs to the first generation of Nepali singers who took singing as a profession. His songs have also been used in movies and dramas.

He completed his School Leaving Certificate exams in 2016 B.S. and obtained Bachelor of Art degree in Humanities from Tri-Chandra College. Later he also went to Maharaja Sayajirao University of Baroda to study classical Indian music, but returned without completing his studies. He married Pemala Lama in 1971. Later he joined the Rastriya Naach Ghar (National Dance Theater) and rose to the post of manager. He also worked as the editor of a musical journal Bageena for its first three issues around 2028 B.S. He became the managing director of Sanskritik Sangsthan; became adviser to the Ministry of Communication and an associate professor in Lalit Kala Campus. He also wrote a musical drama titled Kanchi. He had Diabetes and he died on December 5, 1990.

Narayan Gopal was awarded with several national honours which include;

- Best Composition (Radio Nepal) - 2023 B.S.
- Best Singer (Radio Nepal) - 2024 B.S.
- Ratna Record Award - 2039 B.S.
- Gorkha Dakshin Bahu, Fourth - 2033 B.S.
- Indra Rajya Laxmi Award - 2040 B.S.
- Chhinalata Award - 2044 B.S.
- Jagadamba Shree - 2045 B.S.
- Urbashi Rang Award - 2047 B.S.
- Trishakti Patta, Third - 2048 B.S.
- Narayan gopal singing award - 1969

Discography: Geeti Sradhanjali Vol 1-4, Swarneem Sandhya Vol 1-2, Preyasi Ka Yaad Haru, Prem Ko Mala, Manche Ko Maya, Malai Nasodha, Lali Gurash Bhayechu, Aljhe Cha Kyare, Timro Mann Ma, Geeti Yatra Vol 1, Narayan Gopal Ka Aadhunik Geet Haru Vol 1-9, Malati Mangale (a musical drama)

### **Arun Thapa**

Arun Thapa was born in Kolkata, India in Jan 1952. He was a popular singer of Nepal. His songs like Ritu haruma timi hariyali basanta hau, Bhulu bhulu lagyo malai have touched the heart of millions Nepali music lovers. His contribution in the Nepali music is remarkable and inspires many Nepalese singers in the field of music. His song Reetu haruma timi hariyali basant hau (You are the spring amongst the seasons) is on the number 7 in the lists of The BBC Worlds Top Ten songs.



His father was Ganju Prasad Thapa. His parents moved back to Nepal when Arun was 3 months old. He studied and grew up in Kathmandu, Nepal. He first studied in a school in Gana Bahal Tole then at JP School in Chettrapati. Later he studied in Turnbull High school in Darjeeling, coming back to complete his School Leaving Certificate (SLC) from Kathmandu in 1971. He later studied at Prithvi Narayan Campus, Pokhara for an Intermediate in Arts degree but soon dropped out to pursue a career in music. Family friends Narayan Gopal, Gopal Yonjon, Shankher Lamichhane, who all belonged to his father's generation, influenced his music but he was never one to let those influences get in his way and he blazed a trail of his own, which has the unique Arun Thapa sound. Incidentally, he resided for a large part of his life at Jhamsikhel, Lalitpur ward number 2, where his father owned property. A statue dedicated to him stands at the corner of where his house once stood, to mark the appreciation of the folks who knew him when he grew up as a teenager.

He first started singing at his college where he fell in love with a girl. They ran away from the college to Kathmandu. Mostly, all his songs were in memory of their relationship. He recorded many songs but his career started from super hit song Jati Maya Laye Pani where he received public affection. Before being a popular singer, he had worked in Nepal Bank Limited. Deep Shrestha was his best friend. They would always hang around together. He first sang his song in Radio Nepal in 1971. He had launched two music albums: Arun and The best of Arun. Both of the albums were very popular among the Nepalese music listeners. Thapa had continued his singing career for 30 years. Thapa had long been suffering from lung and liver ailment. He died on 22 July 1999 (BS 2056, Shrawan 5) in Kathmandu.

Discography: Ritu Haruma Timi, Sajhko Jun Sangai, Chot Ke Ho Byatha Ke Ho, Jati Maya Lae Pani, Bhulu Bhulu Lagyo Malai, Aankhako Need Khosi Lane, Jindagi Ke Chaa Ra Aakhir, Aru Sanga Najokha Malai, Dosh Kasailaai Dina Chahhanna, Timi Herchhau Bhane, Yo Manko Ke Bhar Hunchha, Na Pohkine Na Jokhine

### **Gopal Yonzon**

Gopal Yonzon was a one of the most prominent music composer, director, lyricist, singer and music arranger in the history of Nepali music. Gopal Yonzon has over 2000 musical compositions to his credit, ranging from folk, classical, modern to Western music.

Gopal Yonzon was born on August 26, 1943 in Darjeeling. Initially, he specialized as a flutist for local Darjeeling cultural troupes. He had a BA degree in South Asian Music. His elder brother Karma Yonzon is also a well-known Nepali musician. He was associated with numerous stalwarts of Nepali music in his career such as Amber

Gurung, Chetan Karki, Nati Kazi, Narayan Gopal, Nagendra Thapa, Aruna Lama and Udit Narayan Jha. His musical collaboration with Narayan Gopal in the 1960s produced some of the finest music in Nepali. Gopal Yonzon also composed music for Nepali films like Kanchhi and Maya Preeti.

In a brief introduction of Gopal Yonzon on an album cover, Music Nepal, the largest music company in Nepal, writes: "Gopal Yonjan is a music composer, director, lyricist, singer and music arranger, who left us all in May 1997. In his search for excellence, Gopal dedicated his entire life in creating Nepali Music. Through his compositions he illustrates the diversity and beauty of Nepali music with the sensitivity and clarity of a fine painter who touched every stroke with an in-depth understanding of his subject. Gopal's musical genius covered such a wide spectrum that it is not possible to encapsulate the essence of the man in one album. Gopal felt deeply for Nepal and Nepali people. His songs reflects this deep innate bond that he believed would touch a common chords in all Nepalese scattered around the world, transcending man-made barriers and boundaries. His songs hold message especially for the youth of Nepal whom he desired to inspire and motivate."

Some of his memorable songs include Malai Maaf Garideu, Galti Hazar Hunchha, Ai Malai Maya Garne Haru, Kehi Chotley, Lau Suna Ma Bhanchhu, Chumera Pana Bhari, Yeti Chokho, Samhala Ghumtoharu, Jeevan Ko Harek Mod Ma, Timro Jasto Mutu Meropani, Sara Din Arulai, Birsera Pheri Malai Na Hera and Baneko Cha Paharale.

### **Nepali Musical Rock Bands**

The list of Nepali musical bands or groups that have contributed to produce Nepali songs and music is as;

1974 AD, Albatross, Akarshan, Antim Grahan, Anuprastha, Astha, Axix, Bidroha, Bro-Sis, Buds, Catch 22, Cobweb, COD, Crossroads (Sanjay Shrestha), Deurali Band, Dying Out Flame, Full Stop, Horny Monks, Jindabaad, Jugaa, Lakhey, Kandara, Karma Band, Kutumba Band, Mantra, Metal Cross, Milestone, Mukti N Revival, Mongolian Hearts (Raju Lama), Monkey Temple, Newaz, Newa the King, Navras 'N' The Students, Nepathya, Okely, Robin N Looza, Robin and the New Revolution, Seasons Band (Sujil Karmacharya), Sayaas, Sur Sudha, Prism, The Himalayan Band, The Axe, The 11th Hour, The Edge, The Influence (Bhim Tuladhar), The Move (Dhiraj Rai), The Shadows, The Uglyz, The Yellow Hammer, White, X-Mantra, Zenith

## E. The Film

### Who are involved in making a film?

**The terms are used as;**

**Director:** The director controls everything, gives orders to the cast and crew and makes sure that the script is followed.

**Producer:** There can be more than one producer, who is responsible for raising the money to make the film and for other important activities, such as casting and controlling the costs.

**Screenplay Writer:** The person who writes the script. This gives the actors and actresses their lines and explains how the action takes place.

**Cast:** The actor and actresses who appear in the film.

**Extras:** The people who appear in crowd scenes but do not have speaking parts.

**Animatronics Engineer:** The technician responsible for making the robotic creatures used in science fiction and fantasy films.

**Art Director:** The art director coordinates the costumes, sets and make up to set the overall style of the film.

**Best boy:** The deputy electrician, assistant to the gaffer.

**Casting Director:** The person who choose the actors for each role in the film.

**Caterer:** The caterer supplies meals so that the cast and crew can work all day.

**Cinematographer:** The person who directs the lighting and films the action, originally called the cameraman.

**Clapper loader:** Details of each scene are written on a special board called a clapper board. The clapper loader snaps it shut in front of the camera as filming begins to record what is being filmed.

**Composer:** The composer writes the music or adapts an existing score as a backing track to the film.

**Costume designer:** The costume designer is responsible for designing and supplying the special clothing worn by the cast.

**Editor:** The editor cuts and connects the best versions of each section of film to create the final version.

**Gaffer:** The chief electrician, who is responsible for lighting the set. The word may come from slang for grandfather – a senior person respected by everyone. Gaffer tape is the heavy duty tape used on sets to secure cables and almost anything else.

**Key grip:** A grip is responsible for moving the sets and for laying the tracks on which the camera runs. The key grip is in charge of all the other grips.

**Make-up artist:** He or she applies the cosmetics which alter or improve an actor’s look under the studio lights.

**Sound engineer:** This engineer makes sure that the actors’ dialogue and all the other sounds heard on the film are properly recorded and synchronized with the action.

**Special-effects Coordinator:** This person is responsible for creating spectacular scenes through a mixture of photographic, mechanical and computer methods.

**Stunt man:** Specialists who perform the action that is too difficult or dangerous for actor. Stunt doubles are stunt man or women made up to look like the actors so it looks as though the actors have performed a feat themselves.

**Wardrobe mistress:** The wardrobe mistress or master is in charge of the costumers, making sure they fit, are in good condition and available when they are needed for a scene.

### Highest Earning Films

These are the films that have made the most money at the box office worldwide.

<b>Film</b>	<b>Year</b>
Titanic	1997
The Lord of the Rings: The Return of the King	2003
Harry Potter and the Sorcerer’s Stone	2001
The Lord of the Rings: The Two Towers	2002
Star Wars: Episode 1 – The Phantom Menace	1999
Shrek 2 (Animated film)	2004
Jurassic Park	1993
Harry Potter and the Goblet of Fire	2005
Harry potter and the Chamber of Secrets	2002
The Lord of the Rings: The Fellowship of the Ring	2001
Finding Nemo (Animated film)	2003
Star wars: Episode III-Revenge of the Sith	2005
Spider Man	2002
Independence Day	1996

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E.T. the Extra-Terrestrial	1982
Harry Potter and the Prisoner of Azkaban	2004
Spider-Man 2	2004
The Lion King (Animated film)	1994
Star Wars: Episode IV – A New Hope	1977
The Matrix Reloaded	2003

### The Oscars

The Academy Awards or Oscars are the most famous of all film awards. They have been presented since 1929. The awards are voted by the US academy of Motion Picture Arts & Science, which has more than 5500 members including previous nominees in each of 24 categories (apart from special, honorary and technical awards) then select the winners.

The award is a gold-plated statuette, which stands 34.3cm high and weighs 3.8kg. According to legend, academy librarian Margaret Herrick named the statuette Oscar because she thought it looked like her Uncle Oscar. Main categories include Best Picture, Best Director, Best Actor, Best Actress, Best Supporting Actor and Best Supporting Actress, as well as awards for screenplay, cinematography, soundtrack, documentary, foreign film and so on.



**Most wins:** These three films have each won 11 Oscars, including Best Picture; Ben Hur (1959), Titanic (1997) and The Lord of the Rings: The Return of the King (2003).

### Oscar Winners

These are the Best Picture, Best Actor and Best Actress winners since 1990 AD. Oscars were awarded the following year.

Year	Best Picture	Best Actor	Best Actress
1990	Dances with Wolves	Jeremy Irons	Kathy Bates
1991	The Silence of the Lambs	Anthony Hopkins	Jodie Foster
1992	Unforgiven	Al Pacino	Emma Thompson
1993	Schindler's List	Tom Hanks	Holly Hunter
1994	Forrest Gump	Tom Hanks	Jessica Lange
1995	Brave Heart	Nicholas Cage	Susan Sarandon

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1996	The English Patient	Geoffrey Rush	Frances McDormand
1997	Titanic	Jack Nicholson	Helen Hunt
1998	Shakespeare in Love	Roberto Benigni	Gwyneth Paltrow
1999	American Beauty	Kevin Spacey	Hilary Swank
2000	Gladiator	Russell Crowe	Julia Roberts
2001	A Beautiful Mind	Denzel Washington	Halle Berry
2002	Chicago	Adrien Brody	Nicole Kidman
2003	The Lord of the Rings: The Return of the King	Sean Penn	Charlize Theron
2004	Million Dollar Baby	Jamie Foxx	Hilary Swank
2005	Crash	Philip Seymour Hoffman	Reese Witherspoon
2006	The Departed	Forest Whitaker	Helen Mirren
2007	No Country for Old Men	Daniel Day Lewis	Marion Cotillard
2008	Slum dog Millionaire	Sean Penn	Kate Winslet
2009	The Hurt Locker	Jeff Bridges	Sandra Bullock
2010	The King's Speech	Colin Firth	Natalie Portman
2011	The Artist	Jean Dusjardin	Meryl Streep
2012	Agro	Daniel Day Lewis	Jennifer Lawrence
2013	12 Years a Slave	Mathhew McConaughey	Cate Blanchett
2014	Birdman (The Unexpected Virtue of Ignorance)	Eddie Radmayne	Julianne Moore
2015	Spotlight	Leonardo DiCaprio	Brie Larson

## F. Film Industry

The Film Industry or Motion Picture Industry comprises the technological and commercial institutions of filmmaking, i.e., film production companies, film studios, cinematography, screenwriting, pre production, post production, film festivals, distribution, actors and directors.

Currently, the largest markets by box office are United States, China, and Japan; and the countries with the largest number of film productions are India, Nigeria and the United States. Other centers include Pakistan, Hong Kong and in Europe the United Kingdom, France, Italy, Spain, and Germany are the countries that lead movie production.

### Hollywood

Hollywood is the primary nexus of the U.S. film industry with established film study facilities as the American Film Institute, LA Film School and NYFA being established in the area. The first movie studio in the Hollywood area was Nestor Studios, founded in 1911 by Al Christie for David Horsley. Hollywood came to be so strongly associated with the film industry that the word 'Hollywood' came in use colloquially to refer to the entire industry.

The Charlie Chaplin Studios, on the northeast corner of La Brea and De Longpre Avenues just south of Sunset Boulevard, was built in 1917. It has had many owners after 1953, including Kling Studios, which housed production for the Superman TV series with George Reeves; Red Skelton, who used the sound stages for his CBS TV variety show; and CBS, who filmed the TV series Perry Mason with Raymond Burr there. It has also been owned by Herb Alpert's A&M Records and Tijuana Brass Enterprises. It is currently The Jim Henson Company, home of the Muppets. In 1969, The Los Angeles Cultural Heritage Board named the studio a historical cultural monument. The first Academy Awards presentation ceremony took place on May 16, 1929, during a banquet held in the Blossom Room of the Hollywood Roosevelt Hotel on Hollywood Boulevard.

From about 1930 five major Hollywood movie studios from all over the Los Angeles area, Paramount, RKO, 20th Century Fox, Metro Goldwyn Mayer and Warner Bros., owned large, grand theaters throughout the country for the exhibition of their movies. The period between the years 1927 to 1948 is considered the age of the 'Hollywood studio system' or in a more common term, the Golden Age of Hollywood. In a landmark 1948 court decision, the Supreme Court ruled that movie studios could not own theaters and play only the movies of their studio and movie stars, thus an era of

Hollywood history had unofficially ended. By the mid 1950s, when television proved a profitable enterprise that was here to stay, movie studios started also being used for the production of programming in that medium.

## **Bollywood**

Bollywood formally refers Hindi cinema. The name Bollywood is a portmanteau derived from Bombay (the former name for Mumbai) and Hollywood, the center of the American film industry. There has been a growing presence of Indian English in dialogue and songs as well. It is common to see films that feature dialogue with English words (also known as Hinglish), phrases, or even whole sentences. Bollywood is the largest film producer in India and one of the largest centers of film production in the world.

Raja Harishchandra (1913) by Dadasaheb Phalke, was the first silent feature film made in India. By the 1930s, the industry was producing more than 200 films per annum. The first Indian sound film, Ardeshir Irani's Alam Ara (1931), was a major commercial success. The 1930s and 1940s were tumultuous times: India was buffeted by the Great Depression; World War II, the Indian independence movement, and the violence of the Partition. Most Bollywood films were unabashedly escapist, but there were also a number of filmmakers who tackled tough social issues, or used the struggle for Indian independence as a backdrop for their plots.

In 1937, Ardeshir Irani of Alam Ara fame, made the first color film in Hindi, Kisan Kanya. The next year, he made another color film, a version of Mother India. However, color did not become a popular feature until the late 1950s. In the late 1960s and early 1970s, romance movies and action films starred actors like Rajesh Khanna, Dharmendra, Sanjeev Kumar and Shashi Kapoor and actresses like Sharmila Tagore, Mumtaz and Asha Parekh. In the mid 1970s, romantic confections made way for gritty, violent films about gangsters and bandits. Amitabh Bachchan, the star known for his 'angry young man' roles, rode the crest of this trend with actors like Mithun Chakraborty, Anil Kapoor and Sunny Deol, which lasted into the early 1990s. Actresses from this era included Hema Malini, Jaya Bachchan and Rekha.

The 2000s saw a growth in Bollywood's popularity in the world. This led the nation's filmmaking to new heights in terms of quality, cinematography and innovative story lines. Some of the largest production houses as Yash Raj Films and Dharma Productions were the producers of new modern films. The popular actors of 2000s and 2010s includes Aamir Khan, Salman Khan, Sharukh Khan, Hrithik Roshan, Saif Ali Khan, Shahid Kapoor, Akshey Kumar, Ajay Devgan and many more with the hit movies: Lagaan (2001), Devdas (2002), Koi Mil Gaya (2003), Kal Ho Naa Ho (2003),



Dhoom (2004), No Entry (2005), Rang De Basanti (2006), Lage Raho Munnabhai (2006), Dhoom 2 (2006), Om Shanti Om (2007), Chak De India (2007), Singh Is King (2008), Ghajni (2008), 3 Idiots (2009), Golmaal 3 (2010), Dabangg (2010), The Dirty Picture (2011), Singham (2011), Dabangg 2 (2012), Rowdy Rathore (2012), Yeh Jawaani Hai Deewani (2013), Aashiqui 2 (2013), Chennai Express (2013), Krish 3 (2013), Dhoom 3 (2013) and PK (2014) delivering a new generation of popular actors ( Abhishek Bachchan, Shahid Kapoor) and actresses (Aishwarya Rai, Preity Zinta, Rani Mukerji, Kareena Kapoor, Priyanka Chopra, Katrina Kaif, Vidya Balan and Sonakshi Sinha) and keeping the popularity of actors of the previous decade. Among the mainstream films, Lagaan won the Audience Award at the Locarno International Film Festival and was nominated for Best Foreign Language Film at the 74th Academy Awards, while Devdas and Rang De Basanti were both nominated for the BAFTA Award for Best Foreign Language Film.

### **Cinema of Nepal**

The Cinema Industry of Nepal has its own place in the cultural heritage of the country. It is often referred to as 'Nepali Chalchitra' and informally called as 'Kollywood'. The making of Nepali movies is said to have begun with D.B. Pariyar's Satya Harishchandra, which was the first Nepali-language movie to be shot. It was produced from Kolkata, India and was released on September 14, 1951. Aama (mother) was the first film produced in Nepal and was released on October 7, 1964. It was produced by the Information Department of His Majesty's Government of Nepal. It was directed by Hira Singh Khatri and the lead actors were Shiva Shankar Manandhar and Bhuwan Chand, who are regarded as the first actors in the Nepali film industry.

The first film to be produced under a private banner was Maitighar, which was released at the end of 1966 by Sumonanjali Films Pvt. Ltd. Mala Sinha played the lead role, along with Chidambar Prasad Lohani. It had special appearances of Sunil Dutt and comedian Rajendra Nath. Directed by B.S. Thapa and music scored by Jaidev, a veteran maestro, it had Lata Mangeshkar, Asha Bhosle, Usha Mangeshkar and Manna Dey, all of whom were established Indian singers, doing the playback singing with Prem Dhoj Pradhan, C.P. Lohani and Aruna Lama.

The Nepal government established the Royal Nepal Film Corporation in 1971. Mann Ko Bandh was the first film produced by the corporation; Jay Rana was the director. Nati Kaji and Shiva Shankar were the music composers of the songs. Amber Gurung scored the background music. It premiered in 1973 in Kathmandu. Mann Ko Bandh was followed by Kumari (the first Eastman color Nepali film) in 1978, Sindoor

in 1980, and Jeevan Rekha in a series. Their success opened up the avenue for private parties to enter into filmmaking as an industrial endeavor.

Paral Ko Aago, directed by Pratap Subba, in 1978, the black-and-white movie proved to be a great success due to its story and melodious music. The actors were Tanka Sharma, Basundhara Bhusal, Susmita Dhakal, I.K. Singh, Menuka Pradhan, etc. The music director Shanti Thatal became the first female music director in Nepali movies. The lyrics were prepared by Manbahadur Mukhiya and Indra Thapaliya and the songs were sung by Aruna Lama, Dawa Gyalmo, Pema Lama, Shankar Gurung and Deepa Gahatraj (Jha). Pratap Subba was also the scriptwriter. It was based on a popular short story of the same name by Guru Prasad Mainali.

New generation moviemakers geared up to make sensible cinema with entertainment rather than Bollywood inspired socio-actions. Kagbeni, Sano Sansar, Mero Euta Saathi Cha, First Love, Kohi Mero, etc. are some of the fine examples of quality cinema in terms of presentation, performance, story and technical superiority. However, they lacked in connecting with the audience.

In January 2012, the film Loot was released and emerged as a blockbuster. It broke most of the commercial records that were held by the movies before it and turned into a phenomenon among the youth of the country. It was the first movie in decades to be screened more than 100 days in the cinema halls. Much recently Chapali Height broke opening weekend gross by earning 8.4 million at the box office, breaking one of the records held by Loot, but Loot still holds the highest grosser so far. "Nai Nabhannu La 2" released on 11 April, 2014 starring Anubhab Regmi, Sugyani Bhattarai, Jivan Luitel, Priyanka Karki etc. is a blockbuster Nepali movie that celebrated 51 successful days in theaters. The movie is produced by Dinesh Pokharel and directed by Bikash Acharya. According to the film makers, the movie has earned more than 5 crore gross in Nepal and in special shows on demand overseas. 'Kohinoor' directed by Aakash Adhikari emerges as a highest grossing Nepali film which was released on 8 August, 2014. Kohinoor surpassed the lifetime business of 'Nai Nabhannu La 2' and achieved the highest grossing movie of Nepali cinema. Kohinoor is able to break the highest grossing nepali movie record in just 10 days of its release by collecting around 3 crore 15 lakhs within ten days. Shree Krishna Shrestha starrer has succeed to earn around 12 crore within two months of running. Kohinoor features Shree Krishna Shrestha and Sweta Khadka in lead role.

The Film Development Board (FDB) was established by the Government of Nepal for the development and promotion of the Nepali film industry. The Board is a liaison to facilitate the conceptualization, making, distribution and exhibition of Nepali films nationally. The Board attempts to bridge the gap between film entrepreneurship and government bureaucracy.

## Education and Art



### A. Education

Education is about teaching and learning skills and knowledge. Education also means helping people to learn how to do things and encouraging them to think about what they learn. It is also important for educators to teach ways to find and use information.

Through education, the knowledge of society, country, and of the world is passed on from generation to generation. In democracies, through education, children and adults are supposed to learn how to be active and effective citizens. It is the most important factor for the development of human civilization. Education provides the nation with the manpower; promotes national unity and uplifts the consciousness of the people. More specific, education helps and guide individuals to transform from one class to other. Empowered individuals, societies, countries by education are taking edge over individuals stand on bottom pyramid of growth.

## B. Types of Education

Education is a process of learning knowledge, skills, values, beliefs and habits. Educational methods include storytelling, discussion, teaching, training, and directed research. Education commonly is divided formally into such stages as preschool or kindergarten, primary school, secondary school and then college or university. There are different methods of categorizing types of education. One way is to divide it into formal education, non formal education, and informal education.

**Formal Education:** Formal education is usually in school, where a person may learn basic, academic, or trade skills. Small children often attend a nursery or pre-school (kindergarten) but often formal education begins in elementary school and continues with secondary school. Post-secondary education (or higher education) is usually at a college or university.

**Non Formal Education:** Non-formal education includes adult basic education, adult literacy education or school equivalency preparation. In non formal education an adult (or a youth who is not in school) can learn literacy, other basic skills or job skills. There are other possibilities; Home education, individualized instruction (such as programmed learning), distance learning and computer-assisted instruction are some of these possibilities.

**Informal Education:** There is also informal education. For example, a parent teaches a child how to prepare a meal. Teacher can also get an informal education by reading many books from a library. Informal education is when you are not studying in a school and do not use another particular learning method.

### Formal Education

Formal education occurs in a structured environment whose explicit purpose is to teach students. Usually, formal education takes place in a school environment with classrooms of multiple students learning together with a trained, certified teacher of the subject. Most school systems are designed around a set of values or ideals that govern all educational choices in that system. Such choices include curriculum, physical classroom design, student-teacher interactions, and methods of assessment, class size, educational activities, and more.

**Preschools:** Preschools provide education from ages approximately three to seven, depending on the country. These are also known as nursery schools and as kindergarten, except in the US, where kindergarten is a term used for primary education. Kindergarten provides a child-centered, preschool curriculum that aim at unfolding the child's physical, intellectual, and moral nature with balanced emphasis on each of them.

**Primary:** Primary also called elementary education consists of the first five to seven years of formal, structured education of one to fifth grade. In general, primary education schooling starts at the age of five or six, although this varies between, different countries and location. Globally, around 89% of children aged six to twelve are enrolled in primary education. Some education systems have separate middle schools, with the transition to the final stage of secondary education taking place at around the age of fourteen. Schools that provide primary education are mostly referred to as primary or elementary schools. Primary schools are often subdivided into infant and junior school. In context of Nepal, compulsory school education spans over ten years in government schools and twelve years in private boarding school.

**Secondary:** Commonly, secondary education occurs during adolescence. Depending on the system, schools for this period may be called secondary or high schools, middle schools, or vocational schools. The exact meaning of any of these terms varies from one system to another. The exact boundary between primary and secondary education also varies from country to country, but is generally around the eighth to the tenth year of schooling. Secondary education occurs mainly during the teenage years. In the United States, Canada and Australia, primary and secondary education together is sometimes referred to as K-12 education. The purpose of secondary education can be to give common knowledge, to prepare for higher education, or to train directly in a profession. In context of Nepal, sixth to eighth grade is considered as lower secondary; ninth to tenth as secondary and eleventh to twelfth grade as higher secondary.

**Tertiary:** Higher education, also called tertiary, third stage, or postsecondary education, is the non-compulsory educational level that follows the completion of a school such as a high school or secondary school. Tertiary education is normally taken to include undergraduate and postgraduate education, as well as vocational education and training. Colleges and universities mainly provide tertiary education. Individuals who complete tertiary education generally receive certificates, diplomas, or academic degrees. Higher education typically involves work towards a degree-level or foundation degree qualification. In most developed countries; a high proportion of the population enters higher education at some time in their lives. Higher education is therefore very important to national economies. University education includes teaching, research, and social services activities, which includes both the undergraduate, graduate or postgraduate level.

**Vocational:** Vocational education is a form of education focused on direct and practical training for a specific trade or craft. Vocational education may come in the form of an apprenticeship or internship as well as institutions teaching courses such as carpentry, agriculture, engineering, medicine, architecture and the arts.



In several European countries, including Croatia, Denmark, Sweden and Switzerland, parents don't have to send their children to school until they are seven years old, two years later than in many other countries.

### **USA Grade System**

American children have 12 years of schooling. They start at five and the first year at school is called kindergarten. The grade system begins in the second year with first grade (six year olds) and continues to twelfth grade (18 years old). In high schools, years have names instead of numbers: ninth grade is known as the freshman year, tenth as the sophomore year, eleventh as the junior year and twelfth as the senior year.

### **The Oldest Universities of the World**

<b>University</b>	<b>Country</b>	<b>Founded</b>
University of Bologna	Italy	1088
University of Paris	France	1150
University of Oxford	England	1167
University of Cambridge	England	1209
University of Salamanca	Spain	1218
University of Padua	Italy	1222
University of Naples Federico II	Italy	1224
University of Toulouse	France	1229
University of Siena	Italy	1240
University of Valladolid	Spain	1241

## D. Education in Nepal

Education in Nepal was long based on Home schooling and Gurukul. The first formal school was established in 1853 but was intended to the elites. The birth of the Nepalese democracy in 1951 opened the classrooms to a more diverse population.

The education plan in 1971 fastened the development of Education in the country: In 1951, Nepal had 10,000 students divided in 300 schools, with an adult literacy rate of 5%. By 2010, the adult literacy rate had jumped to 60.3% (female: 46.3%, male: 73%) and the number of schools to 49,000. Poverty and social exclusion of women, lower caste, and indigenous people are nowadays the main constraints to an equitable access to Education.

Education in Nepal is structured as school education and higher education. School education includes primary level of grades 1–5, lower secondary and secondary levels of grades 6–8 and 9–10 respectively. Pre-primary level of education is available in some areas. A national level School Leaving Certificate (SLC) examination is conducted at the end of grade 10. Grades 11 and 12 are considered as higher secondary level. Higher Secondary Education Board (HSEB) supervises higher secondary schools which are mostly under private management. Previously these grades were under the university system and were run as proficiency certificate level. Though some universities still offer these programs, the policy now is to integrate these grades into the school system. Higher education consists of bachelor, masters, and PhD levels. Depending upon the stream and subject, bachelor's level may be of three to five years duration. The duration of master's level is generally two years.

Vocational education in Nepal starts after lower secondary education. Students can choose to follow a two year curriculum leading to the 'Technical School leaving Certificate'. Universities also offer professional and technical degrees. Out of the formal track, short-term programs (1 year) focusing on skills development are also available.

### Tertiary Education

#### University

The higher education in Nepal was nonexistent until the establishment of the first college in the country, Tri-Chandra College in 1918. Until 1985, Tribhuvan University had remained the one and the only university in Nepal. In the early 80s, His Majesty's Government developed the concept of a multi-university system for the country. The first new university that was established was Mahendra Sanskrit University. The inception of this university was soon followed by Kathmandu University, the first private university in 1990, Purbanchal and Pokhara Universities in 1995 and 1996 respectively.



### **Medical Colleges**

Medical colleges in Nepal are spread over various parts of the country. Most of these medical colleges in Nepal are in the private sector, although there are some government medical colleges too. Admission of local students to these medical colleges in Nepal is done generally through an entrance test. However foreign students are admitted on the basis



of their performance in a personal interview. In order to be eligible for admission to the Medical courses of IOM, one needs to pass the higher secondary examination in science or its equivalent.

Medical education in Nepal is regulated by the Nepal Medical Council for allopathy and Nepal Ayurveda Medical Council for ayurveda. Apart from giving recognition to the medical colleges in Nepal, it also conducts the licensing examination for providing registration to the new doctors. It is also responsible for making policies related to curriculum, admission, and examination system of teaching institute of medical education.

### **Engineering Colleges**

There are quite a good number of engineering colleges in Nepal that provide engineering courses in various parts of the country. Most of these engineering Colleges in Nepal admit the local students through an entrance test. However foreign students are admitted on the basis of their performance in a personal interview. Candidates, to be eligible for admission to the engineering colleges in Nepal or IOE, should at least pass the Intermediate in Science or diploma in engineering or its equivalent.

Nepal Engineering College (NEC), Changuarayan Bhaktapur, is the first engineering college in the private sector. Architecture, Civil Engineering, Computer Engineering, Electronics and Communication, Electrical and Electronics, Energy Engineering, Civil and Rural Engineering are some of the popular engineering courses in Nepal. While the B.E. Architecture courses are of 5 years duration, other bachelor degree courses are of 4 years duration.

## E. Art



Art is an activity or creation of human creature and his imagination that carry importance because of an attraction to the human senses. The oldest form of art are visual arts, which include creation of images or objects in fields including painting, sculpture, printmaking, photography, and other visual media. Architecture is often included as one of the visual arts; however, like the decorative arts, it involves the creation of objects where the practical considerations of use are essential; in a way that they usually are not in a painting, for example; music, theatre, film, dance, and other performing arts, as well as literature and other media such as interactive media, are included in a broader definition of art.

So, art may includes; drawing, painting, sculpting, photography, performance art, dance, music, poetry, prose and theatre. Art not only reflects the creativity of the artist but also the environment and situation where the artists live. So, it is a reflection of the overall lifestyles of the contemporary society. Art may be characterized in terms of its representation of reality (mimesis), expression, communication of emotion, or other qualities.

### Types of Art

The creative arts are often divided into more specific categories, each related to its technique, or medium, such as decorative arts, plastic arts, performing arts, or literature. Art is one of the few subjects that are academically organized according to technique.

- **Plastic arts:** Plastic arts are art forms which involve physical manipulation of a plastic medium by molding or modeling such as sculpture or ceramics. The term has also been applied more broadly to all the visual arts such as painting, sculpture, film and photography especially as distinguished from art that is written in literature as poetry, creative writing or music.
- **Performing arts:** Performing arts are art forms in which artists use their voices or the movements of their bodies, often in relation to other objects, to convey artistic expression. Performing art including drama; expression using the body: dance, acting, singing and auditory art; expression by making sounds: music, singing.
- **Practical arts:** Practical arts; expression by making things and structures: architecture, filming, fashion, photography, video games and Culinary art; expression by making flavors and tastes: cooking.

### Prehistoric Art

Humans have made art for thousands of years, drawing and making objects that come from their imaginations. The first drawings that we know of were made on cave walls more than 30,000 years ago. These and other early works of art often show what their makers were thinking about life and death. The first sculptures were of animals that have been found on the ends of tools. Another common type of early sculpture is called a Venus figure. This takes the form of a rounded female figure, and symbolizes mother earth that was believed to be the source of all life. In talking about the architecture, the oldest buildings are those made of huge slabs of stone. These buildings often had religious or ritual importance to the people who built them.

### Modern Art

In the 19<sup>th</sup> and 20<sup>th</sup> centuries, painting changed a lot with the invention of the camera, painters no longer felt they had to paint on things were in real life. This could be recorded by photographs. Artists began to try different approaches with colors and shapes. New schools such as impressionism, expressionism and cubism were started by painters exploring new ideas. Many of those new schools first appeared in Europe. The most revolutionary paintings of the 19<sup>th</sup> century appeared in France. Many people were shocked by works that showed naked people doing their everyday things. Edouard Manet's 'The Lucheron on the Grass' showed a naked women sitting in a park. Before

then, only mythical figures had been shown naked. Manet was an important artist in school called impressionism. More recently, artistic production is often called contemporary art or postmodern art.

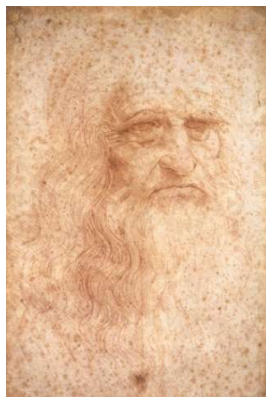
### World's Influential Artists:

#### Pablo Picasso



Pablo Picasso was a Spanish painter, sculptor, printmaker, ceramicist, stage designer, poet and playwright who spent most of his adult life in France. He is regarded as one of the greatest and most influential artists of the 20th century, he is known for co-founding the Cubist movement, the invention of constructed sculpture, the co-invention of collage, and for the wide variety of styles that he helped develop and explore. He was exceptionally prolific throughout the course of his long life. Picasso achieved universal renown and immense fortune for his revolutionary artistic accomplishments, and became one of the best-known figures in 20th-century art.

#### Leonardo Da Vinci



Leonardo was an Italian polymath renowned primarily as a painter. He has been variously called the father of paleontology, ichnology, and architecture, and is widely considered one of the greatest painters of all time. Many historians regard him as the prime exemplar of the Universal Genius or Renaissance Man. Among his works, the 'Mona Lisa' is the most famous and most parodied portrait and 'The Last Supper' is the most reproduced religious painting of all time. In the present era Mona Lisa is arguably the most famous painting in the world. Its fame rests, in particular, on the elusive smile on the woman's face, its mysterious quality brought about perhaps by the fact that the artist has subtly shadowed the corners of the mouth and eyes so that the exact nature of the smile cannot be determined. The shadowy quality for which the work is renowned came to be called Leonardo's smoke. It is said that the smile was so pleasing that it seemed divine rather than human; and those who saw it were amazed to find that it was as alive as the original. Today, Leonardo is widely recognized as one of the most diversely talented individuals ever to have lived.

## F. Art in Nepal

Nepalese Art is renowned for its simplicity, originality and specialty. Its theme has basically been religious, particularly Hindu and Buddhist. Nepali artifacts depict the characters and events of Scriptures, Vedas, Puranas, etc. Nepali artists have always become creative individuals and, far or less, devotees. Nepali art and culture has influenced life style of the neighbors, too. Nepal has remained a land of ancient civilizations. Its art and culture has come a long way. But the early artifacts have not been preserved.

Art of painting is the art or work of using paint on surfaces. Nepali art of painting is highly based on religion. It is supposed to have begun during the lichchhavi period. It was followed by sculptures. The three main categories of paintings; book painting, scroll painting and wall painting are famous in Nepal. Nepalese painting first showed western influences after 1850; which was brought by Bhajuman Chitrakar, a traditional artist who became acquainted with western Realism after visiting Europe. Prime Minister Bir Shumsher visited Britain in 1849 after he became Prime Minister, accompanied by Chitrakar. Soon after Chitrakar's return, western influences were seen in his paintings, marking the start of modern trend. Nepalese painters include Manuj Babu Mishra, Laxman Shrestha, Lain Singh Bangdel and Chitrakar.

Sculpture is the art of making objects of different shapes, sizes & features in glass, metal, stone, wood, or clay. Along with painting, sculpture is connected to religious traditions and practices in Nepal. There is a long tradition in Nepal of making statues or sculptures of different deities from metal or stone. A sculpture of Baman Tribikram erected by Lichchhavi king Man Dev is considered to be the oldest sculpture in Nepal. But, Malla period is known as the golden period for Nepalese sculpture history.

### Painting in Nepal

#### Paubas

Paubha is a traditional religious painting made by the Newar people of Nepal. Paubhas represent the deities, mandalas or monuments. Paubhas are painted on a rectangular piece of canvas. It is prepared by applying a mixture of buffalo glue and white clay on it. The surface is then rubbed with a smooth stone to give it polish. The painting is done according to the rules and dimensions handed down by tradition, and artists cannot exercise their creativity. Most paubhas show Buddhist subjects, but a few have Hindu themes. The paintings are made to



earn religious merit both for the artist and the patron.

### Thangka



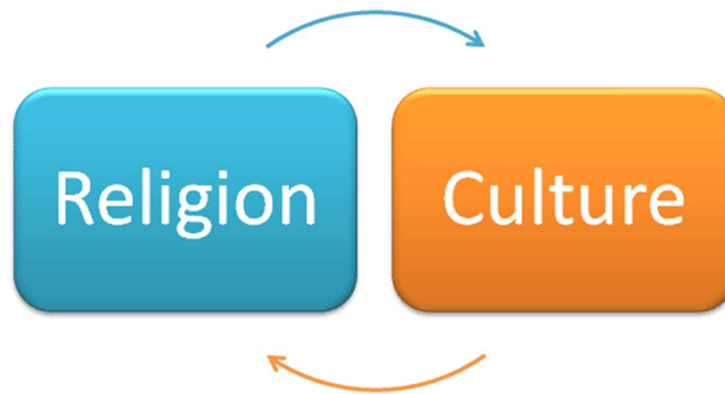
Thangka is a Tibetan Buddhist painting on cotton, or silk applique, usually depicting a Buddhist deity, scene, or mandala. Thangkas are traditionally kept unframed and rolled up when not displayed, mounted on a textile. Thangkas can last a long time, but because of their delicate nature, they have to be kept in dry places where moisture will not affect the quality of the silk. Most thankas are relatively small, comparable in size to a Western half-length portrait, but some are extremely large, several meters in each dimension; these were designed to be displayed, typically for very brief periods on a monastery wall, as part of religious festivals. Most thankas were intended for personal meditation or instruction of monastic students. Thangka serve as important teaching tools depicting the life of

the Buddha, various influential lamas and other deities.

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## Religion and Culture

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Religion is a cultural system of behaviors and practices, world views, ethics, and social organization that relate humanity to an order of existence. About 84% of the world's population is affiliated with one of the five largest religions, namely Christianity, Islam, Hinduism, Buddhism or forms of folk religion.

Religions also teach people right from wrong and try to help people to live peacefully with each other. Religious ceremonies and rituals, such as prayer, allow people to come together to share their faith. But, many of the answers provided by religions cannot be proved to be correct. They are believed through an act of faith. Religious ceremony often involve large gatherings of people, who come together to pray. In some religions, the faithful are expected to undertake a religious journey, called a pilgrimage. Muslims, for example should visit the holy city of Mecca at least once. Several million pilgrims visit Mecca every year.

In every religion, believers take part in rituals. Many rituals are linked to important events such as birth, marriage and death. Theories of religion often explain the origins and workings of religion. In some, a person called a Shaman acts a link between living and the dead. For thousands of year humans have asked questions about life, death, and how the universe began. Many religions try to answer these questions. But, different religion has different theories defined in their own way.

## A. World Religions

There are many religions in the world, from those followed by a very small number of people to others, such as Christianity and Islam, which have hundreds of millions of believers worldwide. Buddhism and Hinduism are very important religions in Asia. Many people follow traditional animist religions which hold that there are spirits living with us.

### Major World Religious Believers

Religion	Percent of followers
Christianity	31.5%
Islam	23.2%
Unaffiliated	16.3%
Hinduism	15.0%
Buddhism	7.1%
Folk Religions	5.9%
Other	0.8%
Sikhism	0.36%

Table: Size of Major religious Group, Pew Research Centre (2012)

### Religious Conflict

Throughout history, there have been wars started over religious disagreements the crusades were a medieval conflict in which Christian armies fought Muslim forces over the holy land (in the middle east). Religious Conflicts have continued to the present day contributing to civil wars, persecution of minority religious groups and terrorism. But, freedom to follow any religion, or no religion, is a basic right in democratic societies.

### Gods and Goddesses

God is conceived as the Supreme Being and principal object of faith. The concept of God as described by theologians (theology is the critical study of concepts of God and of the nature of religious ideas.) commonly includes the attributes of omniscience (infinite knowledge), omnipotence (unlimited power), omnipresence (present everywhere), omnibenevolence (perfect goodness), divine simplicity, and eternal and necessary existence. God is also usually defined as a non-corporeal being without any human biological gender, but the concept of God actively (as opposed to receptively) creating the universe has caused some religions to give "Him" the metaphorical name of



"Father". Because God is conceived as being invisible from direct sight and not being a corporeal being, God cannot be portrayed in a literal visual image; some religious groups use a man (sometimes old and bearded) to signify or symbolize God or his presence because of 'His deed of creating man's mind in the image of His own'.

A goddess is a female deity with supernatural powers and most often have feminine characteristics. However, in some cases goddesses may embody neutral forms personifying both male and female characteristics, or they may even exhibit traits that are traditionally associated with the male gender. Goddesses have been especially linked with virtues such as beauty, love, motherhood and fertility, but because of their flexibility in gender portrayal, they have also been associated with ideas such as war, creation, and death.

In most of the world's major religions today only one god is worshipped. But in many ancient religions followers worshipped a group of gods. Each god has special characteristics and responsibilities, and some could appear in a variety of forms. The myths and legends of ancient cultures and the range of gods worshipped often changed over thousands of years as different gods and goddesses rose and fell in importance.

#### **The Profounder of the Greatest Religions of the World**

Buddhism	– Gautam Buddha
Christian	– Jesus Christ
Islam	– Mohammad Paigambar
Jain	– Lord Mahabir
Sikh	– Guru Nanak
Confucism	– Confucius
Farsism	– Saint Joraster

#### **Religious Texts**

Religious texts, also known as scriptures or holy books, are the texts which various religious traditions consider to be sacred, or central to their religious tradition. Along with Christianity this terminology is used to revere its sacred book; Islam holds the Quran in similar esteem, as does Hinduism the Vedas and Bhagavad Gita and Buddhism the sutras. Many religions and spiritual movements believe that their sacred texts are divinely or supernaturally revealed or inspired.

The oldest known religious text is the Kesh Temple Hymn of Ancient Sumer, the oldest version of which dates to around 2600 BC. The first scripture printed for wide distribution to the masses was the Diamond Sutra, a Buddhist scripture, and is the earliest recorded example of a dated printed text.

## **B. The Sacred Books of Religions**

### **The Koran (Islam)**

Allah is the Islamic name of god. Muslims believe that he revealed his wishes for the world to a man called Muhammad. These messages were later collected together as the Koran (also written Quran). Muslims believe that the words of the Koran are the exact words of Allah. It is said that it has not been altered since it first appeared in A.D. 632. The Koran is written in Arabic, the language which Muhammad spoke and it contains the main teachings of Islam.

### **The Torah (Judaism)**

The Torah is Judaism's most sacred text. It includes the first five books of the Bible, also known as the Pentateuch. These include the laws of the gods revealed to Moses on Mount Sinai. The Jewish scriptures also include the books of the prophets, historical writings and the Talmud. The Talmud contains instructions for following a Jewish way of life and understanding Jewish law.

### **The Vedas (Hinduism)**

The four books of the Vedas contain the earliest Hindu beliefs and they have also influenced Buddhism, Sikhism and Jainism. The Rig Veda is the oldest of the Vedas. It was composed about 1500 BC, although it was written down until 300 BC. The Vedas includes rituals and hymns that give us a glimpse of life in ancient India and Nepal. Another important Hindu text is the Bhagavad Gita, or the Song of the Lord. This is one section of a very long epic poem called the Mahabharata. The Bhagavad Gita is about seven hundred verses long and sets out Hindu philosophy, explaining the importance of selflessness, duty, devotion and meditation.

### **The Pali Canon (Buddhism)**

The Pali Canon is a collection of a sacred text followed by the Theravada school of Buddhism. The teachings of the Buddha were passed on through the spoken word and were not written down until the 1<sup>st</sup> century BC. The Pali Canon is written in the Pali language, and is also known as the Tripitak, meaning three baskets. The texts are divided into three sections which were originally written on palm leaf scrolls and kept in three different baskets. They include rules for Buddhist monks and nuns, tales of the Buddha's life and teachings, stories and philosophical arguments.

### **Guru Granth Sahib (Sikhism)**

Sikhs believe that the Guru Granth Sahib is the supreme spiritual authority and head of the Sikh religion, rather than any living person. The original version was compiled by Guru Arjan Dev, the fifth Sikh guru, in 1604. He collected the compositions of previous gurus over a number of years. The text includes almost 6,000 hymns and poems composed at different times and in different languages, which makes it very difficult to translate. It also includes Hindu and Muslims writing, reflecting the religious tolerance of the gurus.

### **The Bible (Christian)**

The Christian sacred book is called the Bible. It is made up of two parts- the Old Testament and the New Testament. The Old Testament describes the history of the Israelites and contains books of history, law, poetry and wisdom. It was written by different people, probably between 1100 and 200 BC. The New Testament describes the story of Jesus's life and his importance for Christians, and also contains writings by some important early Christians. It was probably written between AD 50 and 150. Passages from the Bible are read at Christian church services, and Christians also see the Bible as containing a code to live by and guidance in following their faith.

### C. Some Hinduism Facts

Hinduism is the ancient religion of Nepal and India, and the oldest religions in the world. Hindus regard the Vedas which was composed around 1500 BC as central to Hindu tradition. The Vedas meaning 'Knowledge' in Sanskrit is the oldest and most authoritative texts of Hinduism. The Hinduism calls for the belief in one Supreme Being, who stands for both the creator as well as the reality. *Karma* which stands for the cause and effect of an individual's choices and destiny is another main belief of Hinduism. The thoughts, actions and words of an individual can affect their *Karma*. Ongoing cycles of Creation, Preservation and Dissolution within the universe are a main belief of Hinduism. Hinduism is a way of life, there is no fixed name given, some call it *Sanatan Dharma*, some call it *Bhagwat Dharma*, etc. There was no name 'Hindu' in old scriptures but later invaders of Nepal and India named people here as Hindu because they used to live on the banks of the river Sindu. The *Bhagwat Gita*, a section of the immense epic known as the *Mahabharat*, believed to be about 2,000 years old, set on the field of the climactic battle of the *Mahabharat*.

#### The Ten Commitments of the Hinduism

1. Ahimsa : Do no harm
2. Satya : Do not lie
3. Asteya : Do not steal
4. Bramhacharya : Do not over indulge
5. Aparigraha : Do not be greedy
6. Saucha : Be clean
7. Santosh : Be content
8. Tapas : Be self disciplined
9. Svadhyaya : Study
10. Ishvara Pranidhana : Surrender to God

#### Names of Priest of Different Tribes

Brahmin/Kshetri – Pandit, Purohit	Chepang – Pande
Gurung – Dhyabre	Jirel – Nakso
Khawas – Dhami	Limbu – Shamba, Phedangma
Newar – Gubhaju, Deubhaju	Rai – Ngongpa
Sunuwar – Naso	Tamang – Lama, Bopo
Tharu – Bharra	

### Religious Words

- **Char Binayak:** Surya, Jal, Ashok and Chandra Binayak
- **Char Dham:** Jagannath, Rameshwor, Dwarika and Badrinath
- **Char Veda:** Rigveda, Yajurveda, Samveda and Arthaveda
- **Char Yug:** Satya, Treta, Dwapar and Kali
- **Dash Avatar (Incarnations):** Fish, Tortoise, Boar, Narsingh, Dwarf, Parshuram (axe wielding human), Ram (the epic king in *Ramayan*), Krishna (the epic prince in *Mahabharat*), Buddha (the founder of Buddhism) and Kalki (the avatar yet to come on the honest of Apocalypse)
- **Dash Disha:** Purba, Agney, Dakshin, Nairitya, Paschim Vayabya, Uttar, Ishan, Akash and Patal
- **Eight Teachings of Buddha:** Sadhbishwas, Sadnischaya, Sadbachhan, Satkarma, Satjibika, Sadprayog, Sadbichar and Sadhyan
- **Enemy of Man:** Kaam, Krodh, Lobh, Moha, Mad and Matsarya
- **Gods of the Day:** Sunday–Agni, Monday–Jal, Tuesday–Bhumi, Wednesday–Indra, Thursday–Hari, Friday–Indrayani, Saturday–Brahma
- **Gods of the Month:** Baishakh–Madhusudan, Jestha–Tribikram, Ashad–Waman, Shrawan–Sridhar, Bhadra–Rishikesh, Aswin–Padmanath, Kartik–Damodar, Mangsir–Keshav, Paush–Narayan, Margha–Madhav, Falgun–Govinda, Chaitra–Vishnu
- **Nawratna:** Moti, Panna, Manik, Gomed, Hira, Muga, Lahsuniya, Pokharaj and Nilam
- **Panch Gyanendriya:** Eye, Ear, Nose, Tongue and Skin
- **Panchadev:** Ganesh, Surya, Devi, Indra and Bishnu
- **Panchadhatu:** Gold, Silver, Copper, Kasha and Bronze
- **Panchakanya:** Ahilya, Dropadi, Kunti, Tara and Madodari
- **Panchamrit:** Cow milk, Ghee, Yoghurt, Honey and Sakhkhar
- **Pancheybaja:** Damaha, Tyamko, Sahnai, Jhyali and Narsingha
- **Panchamahabhut:** Aakash, Vayu, Agni, Jala, Prithvi
- **Sadrash (Six Tastes):** Sweet (Madhur), Sour (Amla), Salty (Lawana), Hot/Pungent (Katu), Bitter (Tikta) and Astringent (Kasaya)/(bitter like taste)
- **Trigun:** Satwa, Raja and Tama; **Tridosha:** Vata, Pitta and Kapha
- **Trikut:** Sutho, Marich and Pipla; **Trimadhu:** Ghee, Sugar and Honey

## D. World Cultural Heritages in Nepal

**Pashupatinath:** It is the holiest place of the Hindus in Nepal which is situated on the bank of the River Bagmati in Kathmandu. This area includes Deupatan, Jayabageshwori, Gaurighat, Kutumbahal, Gaushala, Pingalasthan and the area around the Shleshmantak forest. There are about 492 temples, shrines, chaityas, satalas, etc. mostly built in the pagoda style. There are about thousands *shivalingas* in this area. This area is an excellent combination of ancient art, architecture, sculpture and carvings. The Pashupati Development Trust looks after this area for its preservation and promotion. Thousands of pilgrims and tourists visit this area. It was enlisted in the World Heritage Sites in 1997 AD.

**The Hanumandhoka Durbar Square:** It is located at the centre of Kathmandu. Malla King Pratap Malla constructed and established the statue of Hanuman in front of his palace. Hence, it was named Hanumandhoka. There are some masterpieces of Nepali art and architecture such as the statue of Hanuman, the Basantapur Palace, Taleju Temple, Museum, Kumari House, Kasthamandap, Large Traditional Bell and Kettle-drum in this area. It is a very popular tourist destination. It was enlisted in the World Heritage Sites in 1997 AD.

**The Patan Durbar Square:** It is located in Lalitpur district. There were the palaces of the Malla kings in medieval Nepal. The Patan Durbar Square is famous for its arts and architecture. The most famous Krishna Temple, built in the shikhar style, is located here. Beside this, there are Bhimshen Temple, Bishwanath Temple, Jagat Narayan Temple, Banglamukhi Temple, temple of Kumveswor Mahadev, Rato Machhindranath Temple, Mahabouddha, Statue of Yog Narendra Malla, Patan Museum, Courtyard, etc. which attract a large number of visitors and tourists. It was enlisted in the World Heritage Sites in 1997 AD.

**The Bhaktapur Durbar Square:** This durbar square consists of the palaces of the Malla kings and several temples. It is located in Bhaktapur district, about 15 Km east to Kathmandu. There are majestic palaces and temples such as the Golden Gate Temple, Nyatapola Temple, Dattatraya Temple, Fiftyfive Windowed Palace and several other shrines built in the pagoda and the shikhar styles. There are splendid carvings on the wall, windows and doors. There are marvelous idols and statues. The statue of Bhupatindra Malla, the kettle drum and the big bell are other attractions. The museums and the National Art Museum are also located here. It is among the best visited tourist destinations in Nepal. It was enlisted in the World Heritage Sites in 1997 AD.

**Changunarayan Temple:** It is situated on a hilltop, a few kilometers north to the Bhaktapur Durbar Square. It is located in the east, about 22 km from Kathmandu. The temple is made on the Pagoda style in about 5<sup>th</sup> century. There are small shrines around the temple. The idols and statues of different birds and animals at the entrance doors of the temple are excellent works of art and architecture. There are several inscriptions on stone, wood and metal, which speak of the history of ancient Nepal. It is believed that the temple was constructed during the Lichchhavi period by king Manadev. It was enlisted in the World Heritage Sites in 1997 AD.

**Swayambhunath:** It is situated on a small hilltop in Kathmandu. It is a very important site of Buddhist pilgrimage. There are several shrines, monasteries and idols around the stupa. Recently, the largest idol of Lord Buddha in Nepal has been constructed in Swayambhunath premises. There is a temple of *Saraswati* where the Hindus worship. It is an example of religious tolerance in Nepal. It was enlisted in the World Heritage Sites in 1997 AD.

**Bouddhanath Stupa:** It is situated in Kathmandu. It is one of the holiest place of the Buddhists. It is believed to have been constructed in around 5<sup>th</sup> century. There are more than 45 Buddhist monasteries in this area. Thousands of pilgrims and tourists visit this area. It was enlisted in the World Heritage Sites in 1997 AD.

**Lumbini:** Lumbini is the birthplace of Lord Buddha. It is the most important place of pilgrimage of the Buddhists of the world. It lies in Rupandehi district in the Terai region. There are splendid stupas, and monasteries in Lumbini. There is the Ashoka Pillar erected by emperor Ashoka in 245 BC. Mayadevi Temple and Puskarini Pond are some other attractions. 13 countries including Nepal formed the Lumbini Development Committee in 1970 AD and started the Lumbini Development Master Plan. After that several stupas, monasteries and Vihars have been constructed in Lumbini. There are libraries, a museum and a research centre as well. Many countries such as China, Myanmar, Japan, Germany, France, Vietnam, South Korea, India, and Thailand have contributed to the construction of Buddha Bihars. Lumbini was enlisted in the World Heritage Sites in 1997 AD.

## E. Nepali Dance

As with many cultures of the world Nepali dances have become an integral part of the society. Nepali dance provides that richness which makes the Nepali people unique and lovable. Nepali dances were practiced since the time of the Lichchhavis but it was during the Malla period (1200-1769 AD) that Nepali dances really flourished in the Kathmandu Valley inhabited by the artistically inclined Newars. Among these some are discussed as:

**Mahakali Dance:** This dance re-enacts Goddesses; Mahakali, Mahalaxmi, and Kumari's battle with demons. This dance is performed during the Indraajatra festival (at the end of September) and depicts the 10 days of Dashain, the country's biggest festival.

**Bhairab Dance:** It is performed during Indraajatra, which is of three types: *Sweto* Bhairab dance, *Nilo* Bhairab dance and Bhairab Kali dance. The first is performed at the end of the Mahakali dance while the second is an independent dance form. The Bhairab Kali dance is an erotic dance between the tantric deities, Bhairab and Kali.

**Nava Durga Dance:** A tantric mask dance in honor of the nine manifestations of Durga performed in Bhaktapur in October every year and in Hadigaun, Kathmandu, once every 12 years.

**Lakhey Dance:** Performed during Indraajatra and Krishna Astami festivals, it depicts an ancient legend involving a lakhey (demon) and his capture.

### Buddhist Dances

**Charya Dance:** Newar Buddhist priests (Bajracharyas and Shakyas) perform this dance. It was once practiced in secret with the belief that the gods would be so pleased that they would make an appearance.

**Manjushree Dance:** Depicts the legend Manjushree draining out the water from the Kathmandu Valley thus making it inhabitable.

**Bajrayogini Dance:** A languid dance in honor of Bajrayogini, one of the four tantric goddesses of the Valley.

**Pancha Buddha Dance:** The main ritual dance of the Shakyas. Distinctive colors are worn and particular postures of the Pancha (Five) Buddhas are depicted.

### Nepali Dances of the Hills

**Maruni Dance:** In this popular dance of the eastern hills, a joker-like figure (*dhatu waray*, meaning liar) injects humor into the dance.



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**Sorathi Dance:** This dance is performed over a period of 16 days by the Gurungs of western Nepal between the Dashain and Tihar festivals.

**Ghanto Dance:** It is performed by pre-pubertal Gurung girls during Magh Panchami (near January-end) and ends on Baisakh Purnima (around April-end). The dancers dance as if in a trance.

**Tamang Selo Dance:** This group dance of the Tamangs is performed to the beat of the *dampfu* (a hand held drum).

**Shebru Dance:** It is a dance of the Sherpas who live in the Himalayan regions.

### Nepali Dances of the Terai

**Horiya Dance:** A boisterous dance of the Tharu community, performed during the Holi festival (Fagu Purnima).

**Mungrahawa Dance:** A popular dance of the Tharus of western Nepal and Chitwan in which young boys carrying wooden sticks (*mungros*) dance energetically to their own stick beats and to the beats of many drums.

**Kaharba Dance:** A professional dance of western Terai, dancers move from door to door in small groups.

**Jhinjhia Dance:** Takes place during Dashain in the Terai. It is a night time routine performed by young girls who dance with burning lamps on top of water vessels balanced on their heads.

**Jat-Jatin dance:** A popular dance of Nepal's Mithila region performed on moonlit nights from midnight to dawn during the monsoon months.

**Sama-Chakwa dance:** A fortnight long dance that begins on the day of Chhat, the biggest festival of the Terai, and ends on the full moon.

**Sakhiya Dance:** A popular dance of women of western Nepal, it is performed during the Dashain festival.

**Jhumare Dance:** In this leisurely dance, women dance in a circle to pass idle time.

**Kirtaniya Dance:** An ancient dance performed during Satyanarayan Puja (Worship of Lord Satyanarayan).

**Nachari Dance:** Shiva devotees perform this dance during Maha Shivaratri and Basant Panchami.

## F. Questionnaire

1. Which is the oldest religion of the world? – Hinduism
2. Who is the promoter of Buddhism? – Gautam Buddha
3. Where was Gautam Buddha born? – Lumbini, Nepal
4. Who is the promoter of Christianity? – Jesus Christ
5. Where was Jesus Christ born? – Jerusalem
6. Who is the promoter of Muslimism? – Prophet Mohammad
7. Who is the promoter of Sikhism? – Guru Nanak
8. Who is the promoter of Jainism? – Mahabir Jain
9. Who is known as the ‘Light of Asia’? – Gautam Buddha
10. Who is known as the ‘Light of the World’? – Jesus Christ
11. Who is known as the God of Poetry, Music, Sun, Olympic in Greek? – Apollo
12. Who is the Roman God of Love? – Cupid
13. Who is the Roman Chief God of Sky? – Jupiter
14. Who is the Roman God of Wealth? – Plautus
15. Who is the Roman Goddess of Beauty? – Venus
16. How many chapters are there in ‘Quran’? – 144 Chapters
17. How long was the War of Mahabharat? – 18 days
18. Where was the Mahabharat War held? – Kurukshetra
19. Who were the wives of Lord Ganesh? – Riddhi and Siddhi
20. What was the real name of the writer of Ramayan, Balmiki? – Ratnakar
21. Who walked the seven steps as soon as he took birth? – Gautam Buddha
22. Who was the son of Hanuman? – Makardhwoj
23. Who was the richest God in Hinduism? – Kuber
24. What is the dress of Gautam Buddha called? – Chiwar
25. What is the name of musical instrument of Mahadev? – Damaru
26. Through which Veda, music is said to be originated? – Samveda
27. What are the religious books of Hinduism? – Veda, Geeta, Mahabharat
28. What are the four Vedas? – Samveda, Yajurveda, Atharveda and Ringaveda

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29. Who are the three big gods of Hinduism? – Brahma, Vishnu and Maheshwor
30. What is called to the temple where Mahadev is worshipped? – Shiwalaya
31. What is the name of the snake surrounded in Shiva's neck? – Basuki
32. Where is the living place of Mahadev? – Kailashkut Parwat
33. What is called to the dancing stage of God Shiva? – Natraj
34. What is said to the dance of Shiva? – Tandav Dance
35. Which is the biggest temple of Shiva in Nepal? – Pashupatinath Temple
36. Who is the writer of Veda? – Vedvyas
37. What was the name of father of Ram? – King Dasharath (King of Aayoddha, now in India)
38. Who was the Guru of God Ram? – Vishwamitra
39. Who is called the God of Wisdom, Intelligence, Education and Prudence in Hinduism? – Ganesh
40. Who is called the Goddesses of Intelligence, Consciousness and Comic Knowledge in Hinduism? – Saraswati
41. Who tried to kill Gautam Buddha? – Devdatta
42. Who is regarded as the direct observer of the Mahabharat Battle? – Yalambar
43. Who is the mother of Pancha Pandap? - Kunti
44. Who is the founder of Ayurveda and Yoga? – Dhanwontari and Patanjali
45. Who was the last king of Dwapar Yug? – Janma Jaya
46. Who was 'Haldhar' in Mahabharat? – Balaram
47. Who was the wife of Balaram? – Rohini
48. What was the name of Arjun's son? – Abhimanyu
49. Who is praised in 'Gayatri Mantra'? – Surya (Sun)
50. According to the Hindu mythology, who donated the entire nation to the Vishwamitra? – Harish Chandra
51. How many Upanishads are there in Hinduism? – 13
52. Which Palestine Ruler killed Jesus Christ? – Herod
53. With which religion is the Golden Temple in Amritsar, India associated? – Sikhism

54. According to Hindu mythology, who died for the first? – Yamaraj
55. From where has Ravan kidnapped Sita? – Panchawatti
56. Who is known as the king of God and Goddesses in Hinduism? – Indra
57. Which festival is celebrated at the end of Ramjaan in Muslim community? – Ide
58. To which religion 'Boom Path' related? – Buddhism
59. What is the name of the book that has described the Life and work of Jesus Christ? – New Testament
60. Which is the biggest holy place of Christian? – Jerusalem
61. What is called for the 'Magh Sukla Panchami'? – Shree Panchami
62. Which Jatra is celebrated on Baisakh Purnima in Kathmandu valley? – Bisket Jatra
63. Which race of Nepal celebrates Dhan Dance? – Limbu
64. Which race of Nepal celebrates Chandi Dance? – Rai
65. What is the racial dance of Tharu community? – Jhijhiya
66. Which race of Nepal celebrates Sorathi Dance? – Gurung
67. Which race of Nepal celebrates Kaura Dance? – Magar
68. Where does the kingdom Tilaurakot of King Suddhodan lie now? – Kapilvastu
69. Where does the famous religious and tourist place Swargadwari lie? – Pyuthan
70. Where does the famous religious place Devighat lie? – Nuwakot

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## Language and Literature

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### A. Language

Language is a medium of expressing feeling or knowledge with each other during conversation. It is the human ability to acquire and use complex systems of communication. The scientific study of language is called linguistics.

Language is thought to have originated when early hominines started gradually changing their primate communication systems. The development is sometimes thought to have coincided with an increase in brain volume. Language is processed in many different locations in the human brain, but especially in Broca's and Wernicke's areas. Humans acquire language through social interaction in early childhood, and children generally speak fluently when they are approximately three years old. The use of language is deeply entrenched in human culture. Therefore, in addition to its strictly communicative uses, language also has many social and cultural uses, such as signifying group identity, social stratification, as well as social grooming and entertainment.

## B. Languages around the World, Foundation and the System

The number of languages in the world, estimation varies between 5,000 and 7,000. Natural languages are spoken or signed, but any language can be encoded into secondary media using auditory, visual, or tactile stimuli; for example, in graphic writing, braille, or whistling. This is because human language is modality independent. Human language has the properties of productivity, recursively, and displacement, and relies entirely on social convention and learning. Its complex structure affords a much wider range of expressions than any known system of animal communication.

In context of Nepal, 123 languages are spoken in the country as per the 2011 census. Nepal's linguistic heritage has evolved from three major language groups: Indo-Aryan, Tibeto-Burman, and indigenous. The major languages of Nepal (percent spoken as mother tongue) are Nepali (44.6%), Maithili (11.7%), Bhojpuri (6%), Tharu (5.8%), Tamang (5.1%), Nepal Bhasa (3.2%), Magar (3%) and Bajjika (3%). Nepali, written in Devanagari script, is the official national language. Maithili language that was originated in Mithila region of Nepal is the de-facto official language of Nepal and Madhesh as a whole. Maithili is spoken in Nepal as a second language. Extinct languages of Nepal include Kusunda, Madhesiya and Waling.

### Most Spoken Languages of the World

Half of the world's population speaks the 13 most populous languages. The following table lists the languages of the world with the largest number of native speakers as estimated by the Swedish *National encyklopedin* (2007, 2010).

Language	Approximate Number of Speakers
Chinese (Mandarin)	955 million (14.4%)
Spanish	405 million (6.15%)
English	360 million (5.43%)
Hindustani	310 million (4.70%)
Arabic	295 million (4.43%)
Portuguese	215 million (3.27%)
Bengali	205 million (3.11%)
Russian	155 million (2.33%)
Japanese	125 million (1.90%)
Panjabi	102 million (1.44%)
German	89 million (1.39%)

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Javanese	82 million (1.25%)
Wu	80 million (1.20%)

### Letters of the Alphabet

An alphabet is the basis of a system of writing, using letters or characters to represent sounds or words. These are the letters of the some of the alphabets;

Chinese	40-50,000
Japanese	18,000
Khmer/Cambodian	74
Sanskrit	48
Nepali	36
Cyrillic	33
Persian	32
Spanish	29
Turkish	29
Arabic	28
German	27
Hebrew	27
English	26
French	26
Greek	24
Roman	23
Early Latin	21
Italian	21
Hawaiian	12
Rotokas	11

### Braille

Braille is a system of raised dots that allows blind people to read by touch. It was invented in the 19<sup>th</sup> century by a blind Frenchman named Louis Braille. The dots are embossed on to paper, either by hand or using a machine. They are read by moving the fingers across the top of the dots. The reader uses



both hands- the right works out the message while the left feels ahead for the beginning of the next line. A skilled Braille reader can understand up to 1150 words a minute, which about half of the speed of a sighted person is reading ordinary text. The basic unit of Braille is called a cell. It is made up of six dots, which allows for 63 possible combinations to represents letters, numbers and punctuation marks.

### Sign language

Everyone makes hand gestures to show certain feelings: you might rub your stomach to show you are hungry, raise your fist as a threat or hold your thumb up to show approval. The most important means of ‘speaking’ by hand gestures is between deaf people. Sign language for the deaf was first used in 17th century Europe. In the 18<sup>th</sup> century schools were set up



where national systems of sign language developed. As a result, a number of versions are used around the world with different ways of signing words. Singers use the different finger positions, a variety of hand movements-upward, downward and so on- and make the signs against certain parts of the body such as neck, arm and wrist.

### Post Firsts

First air letter, England to France, by balloon	1785
First mail carried by rail, UK	1830
First postage stamps in regular use, Penny Blacks, UK	1840
First Christmas cards, invented by Henry Cole, UK	1843
First US stamps	1847
First perforated stamps, Penny Reds, UK	1847
First letter boxes in UK (St Helier, Jersey)	1852
London postal districts first used	1858
First postcard sent, USA	1861
First picture postcard, Switzerland	1872
First commemorative stamps, Germany	1887
First Christmas stamp, Canada	1898
First airmail service, India	1911



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First transatlantic airmail service	1939
First postcodes, Germany	1942
First zip (Zone Improvement Plan) codes, USA	1963
First self-adhesive stamps, Sierra Leone	1964
Harry Potter and the Goblet of Fire stamps issued in Australia	2005

#### **International Auxiliary Language**

An international auxiliary language (IAL/auxlang) is a language meant for communication between people from different nations who do not share a common first language. An auxiliary language is primarily a second language.

Languages of dominant societies over the centuries have served as auxiliary languages, sometimes approaching the international level. Latin, Greek and the Mediterranean Lingua Franca were used in the past, and Arabic, English, French, Russian, Spanish, and Standard Chinese have been used as such in recent times in many parts of the world. However, as these languages are associated with the very dominance; cultural, political, and economic; that made them popular; they are often also met with resistance. For this reason, some have turned to the idea of promoting an artificial or constructed language as a possible solution.

The term auxiliary implies that it is intended to be an additional language for the people of the world, rather than to replace their native languages. Often, the term is used to refer to planned or constructed languages proposed specifically to ease international communication, such as Esperanto, Ido and Interlingua. However, it can also refer to the concept of such a language being determined by international consensus, including even a standardized natural language (e.g., International English), and has also been connected to the project of constructing a universal language.

## C. Literature



Literature, in its broadest sense, is any written work of writing formed with letters, although some definitions include spoken or sung texts. More restrictively, it is writing that possesses literary merit, and language that foregrounds literariness, as opposed to ordinary language. Literature can be classified according to whether it is fiction or non-fiction and whether it is poetry or prose; it can be further distinguished according to major forms such as the novel, short story or drama; and works are often categorized according to historical periods or their obedience to certain aesthetic features or expectations (genre).

Taken to mean only written works, literature was first produced by some of the world's earliest civilizations—those of Ancient Egypt and Sumeria—as early as the 4th millennium BC; taken to include spoken or sung texts, it originated even earlier, and some of the first written works may have been based on an already-existing oral tradition. As urban cultures and societies developed, there was propagation in the forms of literature. Developments in print technology allowed for literature to be distributed and experienced on an extraordinary scale, which has culminated in the twenty-first century in electronic literature.

## D. Literature Form, Invention and Type

### Major Forms of Literature

#### Poetry

Poetry is a form of literary art which uses artistic and rhythmic qualities of language to evoke meanings. Poetry has traditionally been distinguished from prose by its being set in verse; prose is cast in sentences, poetry in lines; the syntax of prose is dictated by meaning, whereas that of poetry is held across meter or the visual aspects of the poem. Prior to the nineteenth century, poetry was commonly understood to be something set in musical lines; accordingly, in 1658 a definition of poetry is 'any kind of subject consisting of Rhythm or Verses'. Possibly as a result of Aristotle's influence (his *Poetics*), poetry before the nineteenth century was usually less a technical designation for verse than a normative category of fictive or rhetorical art. As a form it may pre-date literacy, with the earliest works being composed within and sustained by an oral tradition; hence it constitutes the earliest example of literature.

#### Prose

Prose is a form of language that possesses ordinary syntax and natural speech rather than rhythmic structure; in which regard, along with its measurement in sentences rather than lines, it differs from poetry.

- **Novel:** a long fictional prose narrative. It was the form's close relation to real life that differentiated it from the chivalric romance; in most European languages the equivalent term is roman, indicating the proximity of the forms. In English, the term emerged from the Romance languages in the late fifteenth century, with the meaning of "news"; it came to indicate something new, without a distinction between fact and fiction. Although there are many historical prototypes, so-called "novels before the novel", the modern novel form emerges late in cultural history—roughly during the eighteenth century. Initially subject to much criticism, the novel has acquired a dominant position amongst literary forms, both popularly and critically.
- **Novella:** in purely quantitative terms, the novella exists between the novel and short story; the publisher Melville House classifies it as "Too short to be a novel, too long to be a short story". There is no precise definition in terms of word or page count. Literary prizes and publishing houses often have their own arbitrary limits, which vary according to their particular intentions. Summarizing the variable

definitions of the novella, William Giraldi concludes "it is a form whose identity seems destined to be disputed into perpetuity". It has been suggested that the size restriction of the form produces various stylistic results, both some that are shared with the novel or short story, and others unique to the form.

- **Short story:** a dilemma in defining the "short story" as a literary form is how to, or whether one should, distinguish it from any short narrative; hence it also has a contested origin, variably suggested as the earliest short narratives (e.g. the Bible), early short story writers (e.g. Edgar Allan Poe), or the clearly modern short story writers (e.g. Anton Chekhov). Apart from its distinct size, various theorists have suggested that the short story has a characteristic subject matter or structure; these discussions often position the form in some relation to the novel.

### The Invention of Writing

Writing began in Sumer, Mesopotamia, as a means of keeping track of the food stores that farming has made possible. Writing developed as systems of pictograms or symbols that stand for objects. Eventually, the pictograms developed into the phonetic writing that most of us use today. In phonetic writing, the symbols represent the sounds that make up the words. Writing is one of the most important developments in history. It allows us to express ideas and record history.

### Types of Book

**Almanac:** This is an annual calendar of dates and events. It originally contained astronomical facts and figures, but now includes useful statistics and other information. Almanac is sometimes spelled almanack.

**Anthology:** A collection of writings by one author or on a theme, such as an anthology of animal poems.

**Atlas:** A book of maps.

**Autobiography:** An account of a person's life written by himself or herself. Sometimes a 'ghost' writer may help someone write an autobiography.

**Bibliography:** A list of books or sources on a particular subject.

**Biography:** A book about someone's life written by another person.

**Chronology:** A dictionary of dated events.

**Dictionary:** An alphabetical list of words and their meanings. There are also dictionaries on a single subject, for example *Medical Dictionary*, *Dictionary of Art*.

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**Directory:** An alphabetical list of names and addresses of people or organizations.

**Encyclopedia:** A book of articles on many subjects, arranged alphabetically. Encyclopedias are often published in many volumes on CD-ROM or on the internet.

**Gazetteer:** A book that lists and describes places (countries, cities, etc).

**Glossary:** A list of words and phrases used in a particular subject area, for instance A Glossary of Computer Terms.

**Language Dictionary:** A dictionary that gives translations of words and phrases to and from other languages, for example a Nepali-English/English-Nepali Dictionary.

**Monograph:** A book on a specialized subject, such as the work of a particular artist.

**Novel:** A work of fiction, usually involving imaginary people. A historical novel may be about real historical characters.

**Novella:** A short work of fiction.

**Phrasebook:** A book for travelers, with translations of words and phrases into and from a foreign language.

**Thesaurus:** A book organized to show words with similar meanings.

**Travel Guide:** A book of information about a particular country or area.

**Yearbook:** An annual reference book with information about the events of the previous year. Yearbooks containing statistical information about a country are often called *Abstracts*.

### Largest Libraries

A library is a collection of books and other printed material. The word library can also be used to describe the building where a collection of books is kept, as well as manuscript, maps, periodicals and photographs. Below are the world's largest libraries each containing over 10 million books.

<b>Library</b>	<b>Location</b>
Library of Congress	Washington DC, USA
British Library	London, UK
National Library of Canada	Ottawa, Canada
New York Public Library	New York, USA
Russian State Library	Moscow, Russia
Harvard University Library	Massachusetts, USA
Library of Russian Academy of Science	St Petersburg, Russia
Boston Public Library	Massachusetts, USA

## E. World Literature

### The Greatest Literatures of different Languages

<b>Nepali:</b>	Bhanubhakta Acharya, Laxmi Prashad Devkota, Lekhnath Paudyal
<b>English:</b>	William Shakespeare
<b>Sanskrit:</b>	Kalidas
<b>Greek:</b>	Homer
<b>Latin:</b>	Virgil
<b>German:</b>	Goethe
<b>Hindi:</b>	Tulsi Das, Surdas
<b>Italic:</b>	Dante
<b>Urdu:</b>	Mirza Ghalib
<b>Bengali:</b>	Rabindra Nath Tagore
<b>Chinese:</b>	Lao-Tsu
<b>French:</b>	Sully Prudhonne
<b>Farsi:</b>	Shekh Sadi
<b>Persian:</b>	Abul Fajal



### Nobel Prize for Literature

Nobel prizes have been given every year since 1901 for achievements in different fields of literature which is one of many Nobel Prizes given in honor of Alfred Nobel. Every year, a writer is chosen by the Swedish Academy to receive the Nobel Prize in Literature. Nobel Prize winners of literature include poets, playwrights and authors from all over the world. Sully Prudhomme from France was the first Nobel Prize Winner in 1901. The country with the most recipients of the Nobel Prize in Literature is France, with 15, followed by the United States and the United Kingdom, each with 10.

- 2015** Svetlana Alexievich (Belarus, Russian) in Genre; history, essay
- 2014** Patrick Modiano (France, French) in Genre; novel
- 2013** Alice Munro (Canada, English) in Genre; short story
- 2012** Mo Yan (China, Chinese) in Genre; novel, short story
- 2011** Tomas Transtromer (Sweden, Swedish) in Genre; poetry, translation
- 2010** Mario Vargas Llosa (Spain, Spanish) in Genre; novel, short story, essay, drama
- 2009** Herta Muller (Germany, German) in Genre; novel, poetry

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- 2008** J.M.G.Le Clezio (France, French) in Genre; novel, short story, essay, translation  
**2007** Doris Lessing (UK, English) in Genre; novel, drama, poetry, short story, memoirs  
**2006** Orhan Pamuk (Turkey, Turkish) in Genre; novel, screenplay, essay  
**2005** Harold Pinter (UK, English) in Genre; drama  
**2004** Elfriede Jelinek(Austria, German) in Genre; novel, drama  
**2003** J.M. Coetzee (South Africa, English) in Genre; novel, essay, translation  
**2002** Imre Kertész (Hungary, Hungarian) in Genre; novel  
**2001** V.S. Naipaul (UK, English) in Genre; novel, essay  
**2000** Gao Xingjian (China, Chinese) in Genre; novel, drama, literary criticism

#### Book Firsts and Records

**First Printed Books:** Books were printed in China in the 8<sup>th</sup> century using woodblocks, and in 14<sup>th</sup> century, China and Korea using movable type.

**First Books Printed in English:** In 1474, William Caxton printed the first book in English, *Recuyell of the Historyes of Troye*. It was printed in Bruges, Flanders. Chaucer's Canterbury Tales was probably the first book in English to be printed in England, in about 1477.

**Longest Nobel:** A science fiction Nobel by French writer Georges Jean Arnaud, *La Compagne des Glaces*, runs to 62 volumes and has about 11,000 pages.

**First Sequel:** Daniel Defoe wrote *The Farther Adventures of Robinson Crusoe* in 1719, after the success of *Robinson Crusoe* earlier that year.

**Smallest Book:** This was produced by a German typographer Josua Reichert and called *The World's Smallest Book*. It measures 2.4 × 2.9mm – the size of a match head.

**Largest Book:** The largest ever book was published in 2003. It is a collection of photographs called *Bhutan: A Visual Odyssey Across the Kingdom*. When opened out it measures 2.1 × 1.5m – almost the size of a table tennis table which costs \$10,000 a copy.

**Electronic Books:** Electronic books or eBooks, have been around for over 25 years. The earliest ones could not store much information and has tiny screens that were difficult to read, such as an electronic Bible (1991) that could display four lines at a time. The latest electronic books are small, light, and hold huge volumes of data that can be downloaded from the Internet.

**World Famous Books and Authors**

<b>Books</b>	<b>Authors</b>
1. 1984	George Orwell
2. A Mid Summer Night's Dream	William Shakespeare
3. Age of Reason	Jean Paul Santre
4. All for Love	John Dryden
5. An account of Kingdom of Nepal	F. D. Hamilton
6. Animal Farm	George Orwell
7. Arms and the Man	George Bernard Shaw
8. Beloved	Tony Morrison
9. Blind Beauty	Boris Pasternak
10. Comedy of Errors	William Shakespeare
11. Comers	John Milton
12. Communist Manifesto	Karl Marx
13. Conquest of Self	Mahatma Gandhi
14. Decent of Man	Charles Darwin
15. Discovery of India	Jawaharlal Nehru
16. Doctor's Dilemma	George Bernard Shaw
17. Father and Sons	Evan Turgnev
18. Freedom from Fear	Aung San Suu Kyi
19. French Revolution	Thomas Karley
20. Gardner	Rabindranath Tagore
21. Good Earth	Pearl S. Buck
22. Hamlet	William Shakespeare
23. Hard Times	Charles Dickens
24. Harry Potter	J. K. Rowling
25. History of Nepal	Daniel Wright
26. Home and World	Rabindranath Tagore
27. Human Knowledge	Bertan Russell
28. Imanov	Anton Chekhov
29. Imperial Woman	Pearl S. Buck
30. In Search of Gandhi	Richard Atenbaro



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31. Iron in the Soul	Jean Paul Sante
32. Julius Caesar	William Shakespeare
33. King Lear	William Shakespeare
34. Lady of the Lake	Sir Walter Scot
35. Les Miserables	Victor Hugo
36. Life of Pi	Yann Martel
37. Love in the time of Cholera	Gabriel Garcia Marches
38. Mahabharata	Ved Vyas
39. Mankind and Mother Earth	Arnold Toynabi
40. Merchant of Venice	William Shakespeare
41. Moon Walk	Michael Jackson
42. My Experiment with Truth	Mahatma Gandhi
43. My Truth	Indira Gandhi
44. Olivet Twist	Charles Dickens
45. Othello	William Shakespeare
46. Pakistan: The Gathering Storm	Benazir Bhutto
47. Paper Town	John Green
48. People and Problems	Indira Gandhi
49. Ramayana	Balmiki
50. Romeo and Juliet	William Shakespeare
51. Sons and Lovers	D.H. Lawrence
52. The Diary of a Young Girl	Anne Frank
53. The Godfather	Mario Pujo
54. The Great Gatsby	F Scott Fitzgerald
55. The Lord of the Rings	J. R. R. Tolkien
56. The Old Man and the Sea	Ernest Hemmingway
57. The Story Teller	Mario V. Llosa
58. Think and Grow Rich	Napoleon Hill
59. War and Peace	Leo Tolstoy
60. Wuthering Heights	Emily Bronte

## F. Nepali Literature

### The First in Nepali Language and Literature

<b>Modern Drama</b>	:	Mutuko Byatha (Balkrishna Sam)
<b>Printed Drama</b>	:	Gyanbhang Tarangini (Medini Prasad)
<b>Poem</b>	:	Aamako Maya (Gopal Prasad Rimal)
<b>Story</b>	:	Pinas Ko Katha
<b>Modern Story</b>	:	Naso (Guru Prasad Mainali)
<b>Moral Novel</b>	:	Veer Charitra (Girish Ballabh)
<b>Modern Novel</b>	:	Rupmati (Rudraraj Pandey)
<b>Gajal</b>	:	Motiram Bhatta
<b>Newspaper</b>	:	Gorkhapatra (1958)
<b>Lyric</b>	:	Gitlahari (Basanta Sharma)
<b>Essay</b>	:	Dibyopadesh (Prithvi Narayan Shah)
<b>Modern Essay</b>	:	Mahendra Malli (Shumbhu Prasad Dhungel)

### Special Titles of Some Nepali Literatures

<b>Title</b>	<b>Literatures</b>
Aadhi Kabi	Bhanubhakta Acharya
Abhilasi	Jitendra Mahat
Adhunik Kabi	Gopal Prasad Rimal (Modern Poet)
Ashu Kabi	Shambhu Prasad Dhungel
Bairagi Kaila	Tilbikram Nemwang
Byakul Maila	Pradeep Kumar Rai
Chandani Shah	Late Queen Aishwarya
Chhinalata	Romala Devi Shah
Janakabi Keshari	Dharmaraj Thapa
Jitali	Bam Bahadur Malla
Kabi Keshari	Chittadhar Hridaya
Kabi Shiromani	Lekhnath Paudyal
Maha Kabi	Laxmi Prasad Devkota
Malla Gothale	Bijay Kumar Malla
Parijat	Bishnu Kumari Waiba
Prawasi	Haribhakta Katuwal
Sringar Kabi	Motiram Bhatta
Yuba Kabi	Motiram Bhatta

### Achievements in Nepali Literature by different Litterateurs

1. **Bhairav Aryal:** Jai Bhudi, Aalu, Kaukuti, Mahapurush Ko Sangat, Itishree, Jay Bholi, etc
2. **Bhanubhakta Acharya:** Ramayan (Nepali Version), Ram-Gita, Bhakta Mala, etc
3. **Bhupi Sherchan:** Sahid Ko Samjhana, Main Batti Ko Sikha, Ghantaghar, Ghumne Mechmathi Andho Manchhe, etc
4. **Bijaya Malla:** Anuradha, Ek Bato Anek Mod, Baula Kaji Ko Sapana, Patthar Ko Katha, Parewa Ra Kaidi, Dobhan, Kohi Kina Barbad Hos, etc
5. **Bishweshwar Prasad Koirala:** Doshi Chasma, Teen Ghumti, Hitler Ra Yahudee, Faulty Glasses, Atmabrittanta, Jel Jarnal, Narendra Dai, Shwet Bhairabi, Raja, Rastriyata Ra Rajneeti, Sunnima, etc
6. **Diamond Shumsher Rana:** Basanti, Anita, Seto Bagh, Griha Prabesh, Dhan Ko Dhabba, Pratibaddhata, Satprayas, etc
7. **Gopal Prasad Rimal:** Yo Prem, Masan, Aamako Sapana, etc
8. **Laxmi Prasad Devkota:** Muna Madan, Champa, Shakuntal, Sulochana, Prometheus, Prithvi Raj Chauhan, Maharana Pratap, Bana Kusum, Kunjini, Laxmi Nibandha Sangraha, etc
9. **Lekhnath Paudyal:** Taruna Tapasi, Varsha Vichar, Ritu Vichar, Buddhi Vinod, Satya Kali Sambad, Arunodaya, Amar Jyotiko Satya Smriti, Mero Ram, Lalitya, Ganga Gauri, etc
10. **Madhav Prasad Ghimire:** Gauri, Malati, Magale, Himal Pari Himal Wari, Aswathama, Rajeshwari, Sakuntala, Rastra Nirmata, Pallo Gharko Jhyal, Kinnar Kinnari, etc
11. **Ramesh Bikal:** Birano Deshma, Naya Sadak Ko Geet, Aaja Pheri Arko Tanna Pherinx, Urmila Bhauju, Agenako Dilma, Euta Budho Violin Ashakavariko Dhunma, Sagar Uurlanxa Sagarmatha Chuna, Euta Katha Vannu Na Hajuraama, etc
12. **Saru Bhakta:** Chhori Brahmanda, Pagal Basti, Taruni Kheti, Chulee, Gauko Katha Yoesto Hunchha Hai, etc
13. **Siddhicharan Shrestha:** Kopila, Kuhiro ra Gham, Mero Pyaro Okhaldhunga, etc

## G. Important International Days

**January- 26<sup>th</sup>:** World Customs Day

**February- 4<sup>th</sup>:** Cancer Day; **14<sup>th</sup>:** Valentine Day; **21<sup>st</sup>:** Mother Language Day

**March- 8<sup>th</sup>:** Women's Day; **15<sup>th</sup>:** Consumer's Day, Disabled Day; **21<sup>st</sup>:** Forestry Day, International Day for elimination of Racial Discrimination; **22<sup>nd</sup>:** Water Day; **24<sup>th</sup>:** Tuberculosis Day; **27<sup>th</sup>:** Theatre Day

**April- 7<sup>th</sup>:** Health Day; **15<sup>th</sup>:** International Librarians Day; **18<sup>th</sup>:** Heritage Day; **22<sup>nd</sup>:** Earth Day; **Last Saturday of April:** World Veterinary Day

**May- 1<sup>st</sup>:** International Laborer's Day; **3<sup>rd</sup>:** Solar Energy Day, Freedom Day; **8<sup>th</sup>:** Red Cross Day; **12<sup>th</sup>:** International Nurse Day; **15<sup>th</sup>:** Family Day; **21<sup>st</sup>:** World Culture Day; **31<sup>st</sup>:** Anti-Tobacco Day; **2<sup>nd</sup> Sunday of Every May:** Mother's Day

**June- 5<sup>th</sup>:** Environment Day; **20<sup>th</sup>:** Fathers Day; **21<sup>st</sup>:** World Music Day; **26<sup>th</sup>:** Day against Drug Abuse; **27<sup>th</sup>:** Diabetes Day

**July- 11<sup>th</sup>:** Population Day

**August- 1<sup>st</sup>:** Breast Feeding Day; **6<sup>th</sup>:** Hiroshima Day, World Peace Day; **9<sup>th</sup>:** Nagasaki Day; **12<sup>th</sup>:** Youth Day **22<sup>nd</sup>:** Sanskrit Day

**September- 5<sup>th</sup>:** Teacher Day; **8<sup>th</sup>:** Literacy Day; **20<sup>th</sup>:** UN Peace Day; **27<sup>th</sup>:** Tourism Day; **Last Sunday of September:** Heart Day

**October- 4<sup>th</sup>:** Animal Welfare Day; **16<sup>th</sup>:** Food Day

**November- 17<sup>th</sup>:** Students Day; **20<sup>th</sup>:** World Children's Day

**December- 1<sup>st</sup>:** AIDS Day; **10<sup>th</sup>:** Human Rights Day; **23<sup>rd</sup>:** Farmers Day

## H. Questionnaire

1. Which is the first Nepali Newspaper? – Awaaz
2. Who got Madan Prize for maximum time? – Satya Mohan Joshi (three times)
3. Who is the first woman to get prize in Nepali Literature? – Parijaat (2022, Madan Prize)
4. Who took birth in Kushe Aausi and died in the same? – Motiram Bhatta
5. Which is the only one combined written novel by ten literatures? – Aakash Bibhajit Chha (The Sky is Divided)
6. What is the real name of Bhawani Bhikshu? – Bhawani Prasad Gupta
7. Who is known by the name Itihas Siromani? – Baburam Acharya
8. Who wrote the novel ‘Champa’? – Laxmi Prasad Devkota
9. Who is the first editor of Gorkhapatra? – Nardev Pandey
10. Who is the novelist of ‘Toribari’, ‘Bata ra Sapanaharu’ and ‘Paribhashit Aakha’? – Parijaat
11. Who introduced Criticism in Nepali Literature? – Motiram Bhatta
12. Who is the first sexual psychologist story writer? – Bishweshwar Prasad Koirala
13. When did Gorkha Bharat Jivan publish and from where? – In 1950 BS, from Banaras
14. Who is known as the first poet of Nepali language? – Suwa Nanda Das
15. Who is known as the first Nepali literary martyr? – Krishna Lal Adhikari
16. When and where was Guru Prasad Mainali born? – 1957 BS, Kanpur, Kavre
17. Which Nepali creation was translated into Japanese Language? – Seto Bagh (Daimond Shumser)
18. Which three Nepalese literatures died in 6<sup>th</sup> of Shrawan? – BP Koirala, Bal Krishna Sam and Shiv Kumar Rai
19. Who is the first female to receive ‘Sajha Puraskar’? – Dr. Banira Giri
20. When was Bhim Nidhi Tiwari born? – 1968 BS, Kathmandu
21. Which is the first novel to receive ‘Madan Puraskar’? – Maan, Lila Dhawas Thapa
22. Which book of Shakespeare was translated by Laxmi Prasad Devkota? – Macbeth
23. Who is the writer of ‘History of Nepal’? – Daniel Wright

24. Which is the biggest Nepali novel? – Madhavi, Madan Mani Dixit
25. Which award doesn't have amount? – Birendra Pragya Alankar
26. Who is known as the 'Poet of the Sky'? – P.B. Shelly
27. Who is known as the 'Poet of the Poets'? – Edmund Spencer
28. Where was Shakespeare born? – Stratford-upon-Avon, United Kingdom
29. Who is the first Asian to receive 'Nobel Prize'? – Rabindra Nath Tagore
30. Who wrote the book 'Introduction to Nepal'? – Tony Hegan
31. When was the famous book 'Muna Madan' published for the first time? – 1966 BS
32. Who is known as the 'Poet of the Earth'? – John Keats
33. Which was the prize given to Laxmi Prasad Devkota after death? – Tribhuvan Prize
34. Which is the first course book prepared in Nepali language? – Akshrank Sikshya
35. Who is the chancellor of Tribhuvan University? – Prime Minister of Nepal
36. What is the actual name of Laxmi Prasad Devkota? – Tritha Madhav Devkota
37. Who said 'The child is the father of the man'? – Wordsworth
38. Which political personality was awarded the Nobel Prize for Literature? – Winston Churchill (1953)
39. Who is the creator of the National Anthem of Nepal? – Pradip K. Rai (Byakul Maila)
40. Who wrote the National Anthem of India and Bangladesh? – Rabindranath Tagore
41. Which is the first play written in Nepali language? – Hasyakadamba
42. Who are the two members of a family to get 'Madan Puraskar'? – Dhanus Chandra Gautam and Dhurba Chandra Gautam
43. Whose novel is 'Ek Deshki Maharani'? – Keshab Raj Pidali
44. Which is the first epic of Nepali Literature? – Sakuntal
45. Who is the writer of 'Naso'? – Guru Prasad Mainali
46. Which is the oldest language of the world? – Sanskrit
47. Who is the writer of 'Seto Dharti'? – Amar Neupane
48. Who is the writer of 'Pichas Doctor' and 'Taruni Chori'? – Shankar Koirala
49. Who started to write Gajal in Nepali? – Motiram Bhatta
50. Who is the writer of 'Summer Love' and 'Saya'? – Subin Bhattarai

## National and International Popular Personalities

### A. Literature: Poets (Literatures)

#### William Shakespeare

William Shakespeare was an English poet and playwright, widely regarded as the greatest writer in the English language and the world's most excellent dramatist. He was born in Stratford-upon-Avon, Warwickshire, England on 26 April 1564. He is often called England's national poet and the 'Bard of Avon'. His extant works, including some collaboration, consist of about 38 plays, 154 sonnets, two long narrative poems and a few other verses. His plays have been translated into every major living language and are performed more often than those of any other playwrights.



Shakespeare was born and brought up in Stratford upon Avon. At the age of 18, he married Anne Hathaway, with whom he had three children; Susanna, and twins Hamnet and Judith. Between 1585 and 1592, he began a successful career in London as an actor, writer, and part owner of a playing company called the Lord Chamberlain's Men, later known as the King's Men. He appears to have retired to Stratford around 1613 at age 49, where he died three years later. Few records of Shakespeare's private life survive, and there has been considerable speculation about such matters as his physical appearance, sexuality, religious beliefs, and whether the works attributed to him were written by others.

Shakespeare's early plays were mainly comedies and histories, genres he raised to the peak of superiority and artistry by the end of the 16th century. He then wrote mainly tragedies, including Hamlet, King Lear, Othello, and Macbeth, considered some of the finest works in the English language. In his last phase, he wrote tragicomedies, also known as romances and collaborated with other playwrights.

Shakespeare was a respected poet and playwright in his own day, but his reputation did not rise to its present heights until the 19th century. The Romantics in particular

acclaimed Shakespeare's genius and the Victorians worshipped Shakespeare. In the 20th century, his work was repeatedly adopted and rediscovered by new movements in scholarship and performance. His plays remain highly popular today and are constantly studied, performed, and reinterpreted in diverse cultural and political contexts throughout the world.

### Lekhnath Paudyal



Lekhnath Paudyal, the founder of modern Nepali Poetry literature was born in Arghaun Archale, Kaski in 1941 BS. Due to his immense contribution in modern Nepali poetry he is known as the 'Kabi Shiromani'. His most important contribution was to enrichment and refinement of its language rather than to its philosophical breadth.

He received his first lessons from his father then he was sent to the capital, Kathmandu to attend a Sanskrit school. He has gone to holy city of Banaras to continue his higher education. During his stay in India, his young wife died and he has been penniless. During the time he met with little academic success

and he spent the next few years of his life seeking work in India. In 1909 he returned to Kathmandu, where he entered as the employ of Bhim Shumsher, an important member of the ruling Rana family, as priest and tutor. He retained this post for twenty-five years. He became the focal point of a procession around the streets of Kathmandu.

As an educated Brahman, Lekhnath was well acquainted with the classics of Sanskrit literature, from which he drew great inspiration. From an early age, he composed pedantic "riddle-solving" (samasya-purti) verses, a popular genre adapted from an earlier Sanskrit tradition, and his first published poems appeared in 1904. Two poems published in an Indian Nepali journal, Sundari, in 1906 greatly impressed Ram Mani Acharya Dikshit, the editor of the journal Madhavi, who became the first chairman of the Gorkha Language Publication Committee in 1913 and did much to help Lekhnath to establish his reputation as a poet. Among his poems 'Pinjarako Suga' which in directly shatters the contemporary cruel Rana Regime in Nepal was the most reputed poem.

Most of Lekhnath Paudyal's shorter poems are collected in Lalitya (Delicacy), published in two volumes in 1967 and 1968. His longer works, Khanda-Kavya and Mahakavya are



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(with dates of first publication) Ritu Vichar (Contemplation of the Seasons, 1916), Buddhi Vinod (Enjoyments of Wisdom, 1916), Satya-Kali-Samvad (A Dialogue Between the Degenerate Age and the Age of Truth, 1919), Amar Jyotiko Satya-Smriti (Remembering the Truth of Undying Light, 1951), Taruna Tapasi (The Young Ascetic, 1953), and Mero Ram (My God, 1954). Another epic poem, entitled Ganga-Gauri (Goddess of the Ganges).

Kabi Shiromani Lekhnath Paudyal will always be remembered for his numerous poems that entangle themselves with the Nepalese tradition, culture and religion. In his poems we find the heart of Nepal, the fine tunes of the village life, of the beauty of nature and of simplicity. His most renowned work perhaps is the 'Pinjara Ko Suga' in which he has symbolized the then Nepalese people as a parrot inside a cage and the Rana rulers as the jailers. This poem was so successful in making the people realize their situation that many times it was used as the tragic song of politic heroes in jail. He will always be remained in our heart and he is immortal.

## B. Social Actions: Social Activist

### Malala Yousafzai

Malala Yousafzai is a Pakistani activist for female education and the youngest ever Nobel Prize winner (laureate) born on 12<sup>th</sup> of July, 1997. She is known mainly for human rights advocacy for education and for women in her native Swat Valley in the Khyber Pakhtunkhwa province of northwest Pakistan, where the local Taliban had at times banned girls from attending school. Yousafzai's advocacy has since grown into an international movement.



Her family runs a chain of schools in the region. In early 2009, when she was 11–12, Yousafzai wrote a blog for the BBC Urdu detailing her life under Taliban occupation, their attempts to take control of the valley, and her views on promoting education for girls in the Swat Valley. The following summer, journalist Adam B. Ellick made a New York Times documentary about her life as the Pakistani military intervened in the region. Yousafzai rose in prominence, giving interviews in print and on television, and she was nominated for the International Children's Peace Prize by South African activist Desmond Tutu.

On the afternoon of October 9, 2012, Yousafzai boarded her school bus in the northwest Pakistani district of Swat. A gunman asked for her by name, then pointed a pistol at her and fired three shots. One bullet hit the left side of her forehead, travelled under her skin through the length of her face, and then went into her shoulder. In the days immediately following the attack, she remained unconscious and in critical condition, but later her condition improved enough for her to be sent to the Queen Elizabeth Hospital in Birmingham, England, for intensive rehabilitation. On 12 October, a group of 50 Muslim clerics in Pakistan issued a fatwa (the term for the legal opinion in the Islamic faith) against those who tried to kill her, but the Taliban reiterated their intent to kill Yousafzai and her father, Ziauddin Yousafzai. The assassination attempt sparked a national and international outpouring of support for Yousafzai. Deutsche Welle wrote in January 2013 that Yousafzai may have become 'the most famous teenager in the world.' United Nations Special Envoy for Global Education Gordon Brown launched a UN appeal in Yousafzai's name, demanding that all children worldwide be in school by the end of 2015; it helped lead to the ratification of Pakistan's first Right to Education Bill.

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The 2013, 2014 and 2015 issues of Time magazine featured Yousafzai as one of "The 100 Most Influential People in the World". She was the winner of Pakistan's first National Youth Peace Prize, and the recipient of the 2013 Sakharov Prize. In July that year, she spoke at the headquarters of the United Nations to call for worldwide access to education, and in October the Government of Canada announced its intention that its parliament confers Honorary Canadian citizenship upon Yousafzai. In February 2014, she was nominated for the World Children's Prize in Sweden. Even though she was fighting for women's rights as well as children's rights, she did not describe herself as feminist when asked on Forbes under 30 Summit in 2014. In 2015, however, Yousafzai told Emma Watson she decided to call herself a feminist after hearing Watson's speech at the UN launching the HeForShe campaign. In May 2014, Yousafzai was granted an honorary doctorate by the University of King's College in Halifax, Nova Scotia. Later in 2014, Yousafzai was announced as the co-recipient of the 2014 Nobel Peace Prize, along with Kailash Satyarthi, for her struggle against the suppression of children and young people and for the right of all children to education. Aged 17 at the time, Yousafzai became the youngest-ever Nobel Prize laureate. She was the subject of Oscar-shortlisted 2015 documentary '*He Named Me Malala*'. Since March 2013, she has been a pupil at the all-girls' Edgbaston High School (school for girls aged 3 to 18 in the Edgbaston area of Birmingham, England) in Birmingham.

"I had a terrible dream yesterday with military helicopters and the Taliban. I have had such dreams since the launch of the military operation in Swat. My mother made me breakfast and I went off to school. I was afraid going to school because the Taliban had issued an edict banning all girls from attending schools. Only 11 out of 27 pupils attended the class because the number decreased because of the Taliban's edict. My three friends have shifted to Peshawar, Lahore and Rawalpindi with their families after this edict." - Malala Yousafzai, 3<sup>rd</sup> January 2009, BBC blog entry

### **Anuradha Koirala**

Anuradha Koirala is a social activist and the Founder and Executive director of Maiti Nepal, a non-profit organization in Nepal dedicated to helping victims of sex trafficking. She was born in 14th April, 1949 to the Colonel Pratap Singh Gurung and Laxmi Gurung. Anuradha Koirala was brought up in a family that regarded providing services for humankind as the best form of pious work. She studied in Saint Joseph Convent School Kalimpong, India. At the school, sisters and mother further increased her devotion towards the social work.

For more than twenty years, she taught English at various reputed schools of Kathmandu. Mother Teresa was the biggest source of inspiration to initiate a mission for the betterment of humankind. Therefore, in 1993 Ms. Koirala founded Maiti Nepal with the aim of providing services for both children and women who have endured untold pain and suffering, often in silence. Children, girls and women were being trafficked

within and from Nepal for commercial sexual exploitation. She set up Maiti Nepal with a vow to put an end to this heinous crime.

After establishing Maiti Nepal, she plunged into the service of humanity. Her first work was setting up of a rehabilitation home so that she could provide a home to those who have nowhere else to turn on. Now, Maiti Nepal has three prevention homes, nine transit homes, two hospices and a high school. More than one thousand children are getting direct services from Maiti Nepal every day. She made it possible with her firm determination and unprecedented leadership. Maiti Nepal today conducts a wide range of activities. Conducting awareness campaigns, community sensitization, rescue operations, apprehending traffickers, providing legal support to the needy, women empowerment programs, providing anti retro viral therapy (ART) to children and women infected by HIV are regular activities of Maiti Nepal.



So far, Anuradha Koirala has been provided 30 national and international awards in recognition of her courageous acts and lifetime achievement furthering the cause of children's and women's rights. Some of the international awards include German UNIFEM Prize 2007, Queen Sofia Silver Medal Award 2007, The Peace Abbey, Courage of Conscience 2006 etc. Her achievements include liberating twelve thousand girls from brothels, providing ART before the government of Nepal could initiate this process. Due to her continuous struggle, Government of Nepal recognized anti-trafficking day that falls on 5 September. This endeavor was initiated by Maiti Nepal. She was also appointed as a state minister as an honor to her contributions.

Ms. Koirala loves spending time with children; they say that they get warmth of mother and a father. She is self motivated person relishing new and dynamic challenges with a leadership role if required in a team environment or independently. On 23rd September, Ms. Koirala was selected as Top 10 CNN Heroes. And on 25th November 2010 she was declared as CNN Hero of the year through global on line voting. It was the result of her struggle and compassion to fight the social evil of human trafficking. This honor to the daughter of Nepal is a Pride for our Nation.

## C. Politics: Politician

### Barack Obama

Barack Hussein Obama II is an American politician serving as the 44th President of the United States; he is the first African American, and the first person of color, to hold the office. He was born on August 4, 1961 in Honolulu, Hawaii.

His mother, Stanley Ann Dunham, born in Wichita, Kansas, was of mostly English ancestry. His father, Barack Obama, Sr., was a Luo from Kogelo, Kenya. Obama's parents met in 1960 in a Russian language class at the University of Hawaii at Manoa, where his father was a foreign student on scholarship. The couple married on February 2, 1961, and separated in late August 1961. During that time, Obama, Sr. completed his undergraduate economics degree in Hawaii in June 1962, then left to attend graduate school at Harvard University on a scholarship. Obama's parents divorced in March 1964. Obama Sr. returned to Kenya in 1964 where he remarried; he visited Barack in Hawaii only once, in 1971. He died in an automobile accident in 1982, his son being 21 years old at that time.

Of his early childhood, Obama recalled, "That my father looked nothing like the people around me; that he was black as pitch, my mother white as milk - barely registered in my mind." He described his struggles as a young adult to reconcile social perceptions of his multiracial heritage. Reflecting later on his years in Honolulu, Obama wrote: "The opportunity that Hawaii offered to experience a variety of cultures in a climate of mutual respect; became an integral part of my world view, and a basis for the values that I hold most dear."

Obama is a graduate of Columbia University and Harvard Law School, where he served as president of the Harvard Law Review. He was a community organizer in Chicago before earning his law degree. He worked as a civil rights attorney and taught constitutional law at University of Chicago Law School between 1992 and 2004. In 2004, Obama received national attention during his campaign to represent Illinois in the United States Senate with his victory in the Democratic Party primary. He began his presidential campaign in 2007 and, after a close primary campaign against Hillary Rodham Clinton in 2008; he won sufficient delegates in the Democratic Party primaries



to receive the presidential nomination. He then defeated Republican nominee John McCain in the general election, and was inaugurated as president on January 20, 2009. Nine months after his inauguration, Obama was named the 2009 Nobel Peace Prize laureate.

During his first two years in office, Obama signed into law economic stimulus legislation in response to the Great Recession in the form of the American Recovery and Reinvestment Act of 2009 and the Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010. In foreign policy, Obama ended U.S. military involvement in the Iraq War, increased U.S. troop levels in Afghanistan, signed the New START arms control treaty with Russia, ordered U.S. military involvement in Libya in opposition to Muammar Gaddafi, and ordered the military operation that resulted in the death of Osama bin Laden.

Obama was reelected president in November 2012, defeating Republican nominee Mitt Romney, and was sworn in for a second term on January 20, 2013. During his second term, Obama has promoted domestic policies. In foreign policy, Obama ordered U.S. military intervention in Iraq in response to gains made by the Islamic State after the 2011 withdrawal from Iraq, continued the process of ending U.S. combat operations in Afghanistan, promoted discussions that led to the 2015 Paris Agreement on global climate change, brokered a nuclear deal with Iran, and normalized U.S. relations with Cuba.

### **Gagan Thapa**

Gagan Thapa is a Nepalese politician belonging to the Nepali Congress Party, born in Kathmandu on 16th July, 1976 and his ancestral home was in Solukhumbu. He is one of the most popular and influential youth political leader in Nepal and has a large following in various social networking sites. The young generation often portrays him to be their leader as a future Prime Minister of Nepal. Thapa is a central committee member of the Nepali Congress Party. He was also a former member of the constituent assembly I and II (2008–15). He is widely recognized for his speeches and interviews, many Nepalese people believe that he can lead the nation in an executive role if presented with an opportunity.



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In 2008 he became a member of the first constitutional assembly, elected under provision of proportional representation from Nepali Congress. He was in the Fundamental Rights and Directive Principle of the Constituent Assembly and the Natural Resources and Means committee of the Legislative Parliament. Prior to the election, he had held important positions within his party as the general secretary of the NC student wing, Nepal Student Union (2002–04), its vice president (2000–02) and central committee member (1998-2000). He was also the president of the Free Student Union of Tri Chandra College, Kathmandu (1998-00). He completed his master's degree in political science from Tribhuvan University, Kathmandu, Nepal. After the 2006 democracy movement he raised as one of the most prominent youth leaders in Nepal. He is a highly praised political leader among Nepalese youths.

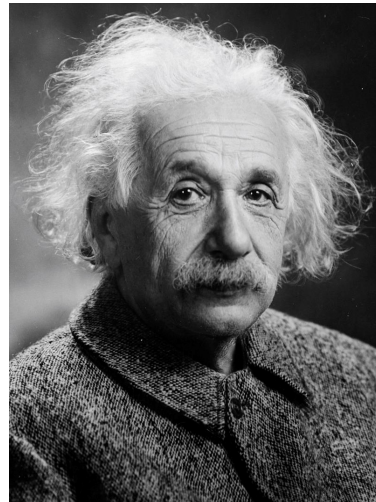
In 2013, he ran as Nepali Congress candidate from Kathmandu constituency-4 in the second Constitutional Assembly election held on November 19, 2013, which he won with a huge margin against his opponents. With 22,336 votes, he emerged victorious over his closest contender Nirmal Kuikel of CPN (UML) who managed to collect only 9,028 votes. The third contender from the same constituency with merely 6,462 votes was Nanda Kishor Pun (Pashang) of the UCPN Maoists, who was also the commander in chief of the party's armed-wing People's Liberation Army, Nepal during the insurgency.

He is also an entrepreneur engaged in agribusiness in Nepal and a philanthropist. He refused to take the salary on extension of duration of constituent assembly beyond the deadline in 2009 and encouraged other to do so. He was the only MP who proposed parties disengage from Nepal bandas (strikes). It was him who wrote the bill to stop the burning of tyres during protests. He fought for the right of Nepali children to get citizenship with their mothers' name. He has publicly stated that he won't be involved in active politics after the age of 55 because he doesn't want his successor to face the same problem of generational shift he faced in his time. This is a symbol of his wholeheartedness and dedication to Nepali politics. He has also written a book named *Nepali Congress in Constituent Assembly*. He has contributed a lot in formulating constitution of Nepal of 2072 BS. He has authored and edited *Nepali Congress kaa Aitehasik Dastaawejharu*, a book on historical database of Nepali Congress party. Recently, he has been defeated in the Position of Secretary General by Dr. Shashank Koirala, son of BP Koirala in the 13<sup>th</sup> General Convention of Nepali Congress. Beside from his political life, he got married with Dr. Anjana KC Thapa in 2008.

## D. Science and Technology: Scientists

### Albert Einstein

Albert Einstein was a theoretical physicist who was born at Ulm in Wurttemberg, Germany on March 14, 1879. Einstein was self-sufficient and thoughtful from his childhood. According to family legend, he was a slow talker, pausing to consider what he would say. He was the son of Hermann Einstein, a salesman and engineer. In 1880, the family moved to Munich, where he later on began his schooling. Later, they moved to Italy and Albert continued his education at Aarau, Switzerland. In 1896, he entered the Swiss Federal Polytechnic School in Zurich to be trained as a teacher in physics and mathematics. In 1901, he gained his diploma, acquired Swiss citizenship and as he was unable to find a teaching post, he accepted a position as technical assistant in the Swiss Patent Office. In 1905, he obtained his doctor's degree.



Einstein and Maric married in January 1903. In May 1904, their first son, Hans Albert Einstein, was born in Bern, Switzerland. Their second son, Eduard, was born in Zurich in July 1910. In 1914, the couple separated; Einstein moved to Berlin and his wife remained in Zurich with their sons. They divorced on 14 February 1919, having lived apart for five years. Einstein married Elsa Löwenthal on 2 June 1919, after having had a relationship with her since 1912. She was a first cousin maternally and a second cousin paternally. In 1933, they emigrated to the United States. In 1935, Elsa Einstein was diagnosed with heart and kidney problems; she died in December 1936.

Einstein developed the general theory of relativity, one of the two pillars of modern physics (alongside quantum mechanics). Einstein's work is also known for its influence on the philosophy of science. Einstein is best known in popular culture for his mass–energy equivalence formula  $E = mc^2$ , which has been dubbed ‘the world's most famous equation’. He received the 1921 Nobel Prize in Physics for his ‘services to theoretical physics’, in particular his discovery of the law of the photoelectric effect, a pivotal step in the evolution of quantum theory.

Near the beginning of his career, Einstein thought that Newtonian mechanics was no longer enough to reconcile the laws of classical mechanics with the laws of the electromagnetic field. This led to the development of his special theory of relativity. He



realized, however, that the principle of relativity could also be extended to gravitational fields, and with his subsequent theory of gravitation in 1916, he published a paper on general relativity. He continued to deal with problems of statistical mechanics and quantum theory, which led to his explanations of particle theory and the motion of molecules. He also investigated the thermal properties of light which laid the foundation of the photon theory of light. In 1917, Einstein applied the general theory of relativity to model the large-scale structure of the universe.

He became a German citizen in 1914 and remained in Berlin until 1933 when he renounced his citizenship for political reasons and immigrated to America to take the position of Professor of Theoretical Physics at Princeton. He became a United States citizen in 1940 and retired from his post in 1945. After World War II, Einstein was a leading figure in the World Government Movement, he was offered to be the President of the State of Israel that he declined and he collaborated with Dr. Chaim Weizmann (Israel's first president) in establishing the Hebrew University of Jerusalem. Einstein always appeared to have a clear view of the problems of physics and the determination to solve them. He had a strategy of his own and was able to visualize the main stages on the way to his goal. He died on April 18, 1955 at Princeton, New Jersey.

Einstein published more than 300 scientific papers along with over 150 non-scientific works. On 5 December 2014, universities and archives announced the release of Einstein's papers, comprising more than 30,000 unique documents. Einstein's intellectual achievements and originality have made the word "Einstein" synonymous with "Genius".

### **Gehendra Shumsher**

Gehendra Shumsher is believed to be the first scientist of Nepal, who was the senior son of the Rana Prime Minister, Bir Shumsher. He was born on Poush, 1928 BS at Kolkata, India where his father was sent as a representative of Nepal. He studied at home in his nursery classes from an English teacher and also enrolled in Durbar High School, the first school of Nepal. He was a very creative, argumentative and serious from his childhood. He loved music, physical exercise, sports and creative works and also wanted to do something different from others. He didn't have much interest in studies rather he used to spend most of his time doing and creating the works of his interest.

When he was young, he was made In-charge of the arms and ammunition of Nepal Army by his father, Bir Shumsher. When Bir was made Prime Minister in 1942 BS, the door of opportunity opened for him. Now, he could work independently to raise the standard of arms and ammunitions of the Army. He established factories to manufacture

essential equipment for soldiers. Electricity power, generator, rice mill, wind motor, etc. were also set up by him. Instead of importing iron and coal from other countries, he used the iron found in his own country, Nepal and used the coal found in Koilabas in Dang to make weapons.

His creative mind was always looking for something new things to do. So, in 1965 BS, Gehendra imported a motor car from Ford Company, Britain. Then he thought, why can't he manufacture such things? So, he studied in detail about every part of the motor car. Of course, he had to separate and dismantle every part of it. Then again, he assembled the various parts of the motor car. Later, King Prithvi Bir Bikram wishes to have that. So, he offered the motor car to the King. He asked for the maps, charts and catalogue from Japan & Britain. He studied each of them in detail and became successful in designing



and manufacturing rifles using his creativity & ability. At that time, there was only a single barrel rifle in the army. He made double barrel rifle and named it 'Ge-Rifle' after the first letter of his name. He also made double barrel gun and named it 'Bir-Gun' after his father's name Bir Shumsher. He also made a new model canon and named it 'Dhir-Gun' after his grandfather's name Dhir Shumsher.

Dev Shumsher succeeded his brother, Bir Shumsher as the Prime Minister of Nepal. Dev was comparatively a liberal ruler. Gehendra was one of the favorites of Dev. So, Gehendra continued his inventions and creations without any impediments. In 1963 BS, on the occasion of Dashain festival, while bowing down to salute Chandra Shumsher, a pistol fell down from the pocket of Gehendra. Chandra Shumsher became suspicious of Gehendra. He didn't react immediately. But after one year, i.e. in 1964, Gehendra died a mysterious death. It is said that Chandra Shumsher was alarmed at the success and popularity of Gehendra and killed him. Thus, Gehendra died at the young age of 35. He would have done much more to develop technology and science in the country had he lived longer. Thus, all inventions and creations of Gehendra are preserved in the National Museum at Chhauni, Kathmandu.

## E. Sports: Players

### Lionel Messi

Lionel Messi (Luis Lionel Andres Messi) was born on 24th of June, 1987, in Rosario, Argentina is an Argentine professional footballer who plays as a forward for Spanish Club, FC Barcelona and is the captain for the Argentina National Football Team. His father was a factory steel worker and his mother was employed as a part-time cleaner. As a young boy, he tagged along when his two older brothers played soccer with their friends, intimidated by the bigger boys. At the age of 8, he was recruited to join the youth system of Newell's Old Boys, a Rosario-based club. Recognizably smaller than most of the kids in his age group, Messi was eventually diagnosed by doctors as suffering from a hormone deficiency that restricted his growth.

By the age of 21, Messi had received Ballon d'Or and FIFA World Player of the Year nominations. The following year, in 2009, he won his first Ballon d'Or and FIFA World Player of the Year awards. He followed this up by winning the inaugural FIFA Ballon d'Or in 2010, and then again in 2011 and 2012. He also won the 'UEFA Best Player' of 2010-11 in Europe Award. At the age of 24, Messi became Barcelona's all time



top scorer in all official club competitions. Messi regained his best form during the 2014–15 campaign. In September 2014 he scored his 400th senior career goal for club and country aged just 27. In November 2014, Messi became the all-time top scorer in La Liga, and the all-time leading goal scorer in the UEFA Champions League.

Messi is often considered the best player in the world and rated by many in the sport as the greatest of all time, Messi is the only football player in history to win the FIFA World Player of the Year/FIFA Ballon d'Or five times, four of which he won consecutively, and the first player to win three European Golden Shoes. With Barcelona he has won seven La Liga titles, two FIFA Club World Cup titles and four UEFA Champions League titles, as well as three Copa del Rey titles.

Messi helped Argentina win the 2005 FIFA U-20 World Cup, finishing as both the best player and the top scorer (with six goals). In 2006, he became the youngest Argentine to play and score in the FIFA World Cup, and won a runners-up medal at the Copa

America in 2007, in which he was named young player of the tournament. In 2008, he won an Olympic Gold Medal with the Argentina Olympic football team. At the 2014 World Cup, he led Argentina to the final, winning four consecutive 'Man of the Match' awards in the process, and received the Golden Ball award as the Best Player of the tournament. In 2013, Sports-Pro rated him the second-most marketable athlete in the world. His playing style and stature have drawn comparisons to compatriot Diego Maradona, who himself declared Messi his successor.

Apart from the Soccer Career, he fell in Love with Antonella Rocuzzo. Messi became a father in November 2012, when his girlfriend, Antonella Rocuzzo, gave birth to their son, Thiago.

### Paras Khadka

Paras Khadka was born on 24th October 1987, in Kathmandu, is a Nepalese cricketer and current captain for the Nepal National Cricket Team. All-rounder Paras is a right-handed batsman, a right-arm medium-fast bowler, and an occasional off break bowler. He made his debut for Nepal against Malaysia in April 2004. Paras Khadka became the sixth Nepali cricketer to score an international century, when he hit an unbeaten 106 off 77 balls against Kuwait during the 2012 ACC Trophy Elite in October 2012. He is also the captain of APF Club in the National League and Vishal Warriors in the Nepal Premier League.



Under his captaincy, Nepal won the 2010 ICC World Cricket League Division Five in Nepal, 2012 ICC World Cricket League Division Four in Malaysia, 2012 ACC Trophy Elite in UAE, 2013 ICC World Cricket League Division Three in Bermuda, 2014 ICC World Cricket League Division Three in Malaysia, participated in the 2014 ICC World Twenty20 in Bangladesh and gained the Twenty20 International status. Arguably, he is one of the best players, Nepal has ever produced and he has become almost synonymous to cricket in Nepal.

In 2006, Paras Khadka went back to the senior side for the ACC Trophy in Kuala Lumpur and also played all four ACC Premier League matches against Hong Kong, UAE, Singapore and Malaysia. He also played in the 2007 ACC Under-19 Cup in Kuala Lumpur where Nepal won against Afghanistan in the final. He was quoted as 'arguably

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good enough to be in the line-up of any of the Test-playing countries' by the World Cup souvenir program.

In the year 2012, Nepal won the 2012 ACC Trophy Elite title in the UAE, where he became the sixth Nepalese cricketer to score an international century, when he slammed an unbeaten 106 off just 77 balls against Kuwait and named the Player of the Tournament. Then he led Nepal to win the 2012 ICC World Cricket League Division Four in Malaysia. He was also named the Player of the Tournament in the 2013 ACC Twenty20 Cup. He led Nepal to win the 2013 ICC World Cricket League Division Three in Bermuda and got qualified for the 2014 Cricket World Cup Qualifier in New Zealand. He also successfully led his country to their first World Cup appearance in the 2014 ICC World Twenty20, after finishing third in the 2013 ICC World Twenty20 Qualifier in UAE just behind Ireland and Afghanistan.

In 2014 ICC World Twenty20 in Bangladesh, he scored 41 runs in both matches against Hong Kong and Bangladesh. He became the eighth player in T-20 history to take wicket on the first ball of career. He set this record against Hong Kong when he took the wicket of Irfan Ahmed on the very first ball of the innings. In the 2015 ICC World Cricket League Division Two, he was again titled as the best player of the tournament, where Nepal qualified for the 2015-17 ICC World Cricket League Championship but failed to secure promotion to Division One and qualification to 2015-17 ICC Intercontinental Cup. In 2016, Nepal won the both matches of ICC World Cricket League Championship against Namibia in Kirtipur Stadium, Kathmandu on 16<sup>th</sup> and 18<sup>th</sup> April, where he gets his second international century in his cricket career, when he slammed 103 off 106 balls and named the Man of the Match.

One of the most popular sportsperson in Nepal, Paras is touted as one of the best all-rounder in Associate cricket whose presence alone gives a huge confidence to his teammates. Whether it is batting, bowling or fielding, Paras leads the team from the front by responsible performance in all the three departments of cricket. His responsibility in all departments is what has guided the Nepal Cricket Team to success. Khadka is a big fan of Australian Cricket Team. He is also interested in football apart from cricket. He has his sporting idol in Steven Gerrard and supports Liverpool Football Club passionately. Paras is also a talented basketball player who plays at the point guard position, he used to play from south sides. Apart from his cricket carrier, Paras married his longtime girlfriend Prapti Rajyalaxmi Rana on 26<sup>th</sup> February 2015.

## Chapter 14

# International Organizations



An international organization is an organization with an international membership, scope, or presence. There are two main types:

International Nongovernmental Organization (INGOs) are the nongovernmental Organizations (NGOs) that operate internationally and include international non-profit organizations, worldwide companies like SOS Children's Villages, Oxfam, Catholic Relief Services, CARE International, and Lutheran World Relief. An INGO may be founded by private philanthropy or international organizations.

Intergovernmental organizations, also known as international governmental organizations (IGOs) are made up primarily of sovereign states (member states). Notable examples include the United Nations (UN), Organization for Economic Co-operation and Development (OECD), Council of Europe (COE), European Union (EU) and World Trade Organization (WTO). The UN has used the term 'intergovernmental organization' instead of 'international organization' for clarity.

The first and oldest intergovernmental organization is the Central Commission for Navigation on the Rhine, created in 1815 by the Congress of Vienna.

## A. United Nations

The United Nations (UN) is an intergovernmental organization established in 24th of October 1945, to promote international co-operation. A replacement for the ineffective League of Nations, the organization was created following the Second World War to prevent another such conflict. At its founding, the UN had 51 member states; there are now 193. The headquarters of the United Nations is situated in Manhattan, New York City. Further main offices are situated in Geneva, Nairobi and Vienna. The organization is financed by assessed and voluntary contributions from its member states. Its objectives include maintaining international peace and security, promoting human rights, fostering social and economic development, protecting the environment, and providing humanitarian aid in cases of famine, natural disaster, and armed conflict.



During the Second World War, US President Franklin D. Roosevelt initiated talks on a successor agency to the League of Nations, and the United Nations Charter was drafted at a conference in April–June 1945; this charter took effect on 24 October 1945, and the UN began operation. The UN's mission to preserve world peace was complicated in its early decades by the Cold War between the US and Soviet Union and their respective allies. The organization participated in major actions in Korea and the Congo, as well as approving the creation of the state of Israel in 1947. The organization's membership grew significantly following wide spread decolonization in the 1960s. After the end of the Cold War, the UN took on major military and peace keeping missions across the world with varying degrees of success.

The UN has six principal organs: the General Assembly (the main deliberative assembly); the Security Council (for deciding certain resolutions for peace and security); the Economic and Social Council (for promoting international economic and social co-operation and development); the Secretariat (for providing studies, information, and facilities needed by the UN); the International Court of Justice (the primary judicial organ); and the United Nations Trusteeship Council. UN System agencies include the World Bank Group, the World Health Organization, the World Food Program, UNESCO, and UNICEF. The UN's most prominent officer is the Secretary General, an office held by South Korean Ban Ki Moon since 2007. The organization won the Nobel Peace Prize in 2001, and a number of its officers and agencies have also been awarded the prize.

### The Secretaries General of UN

The UN Secretariat is headed by the Secretary-General. It provides studies, information, and facilities needed by United Nations bodies for their meetings.

<b>Name of the Secretaries General</b>	<b>Period</b>	<b>Country of Origin</b>
1. Trygve Lie	1946-1952	Norway
2. Dag Hammarskjold	1953-1961	Sweden
3. U Thant	1961-1971	Myanmar
4. Kurt Waldheim	1972-1981	Austria
5. Javier Perez de Cuellar	1982-1991	Peru
6. Boutros Boutros Ghali	1992-1996	Egypt
7. Kofi Annan	1997-2006	Ghana
8. Ban Ki Moon	2007-Present	South Korea

### Specialized Agencies and Organizations of UN

The UN Charter stipulates that each primary organ of the UN can establish various specialized agencies to fulfill its duties. Some of the best known agencies are the IAEA, the FAO, the UNESCO, the World Bank, and the WHO.

<b>Name of the Agency</b>	<b>Headquarter</b>	<b>Estd.</b>
1. Food and Agriculture Organization (FAO)	Rome, Italy	1945
2. International Atomic Energy Agency (IAEA)	Vienna, Austria	1957
3. International Civil Aviation Organization (ICAO)	Montreal, Canada	1947
4. International Fund for Agricultural Development (IFAD)	Rome, Italy	1977
5. International Labor Organization (ILO)	Geneva, Switzerland	1946
6. International Maritime Organization (IMO)	London, UK	1948
7. International Monetary Fund (IMF)	Washington DC, USA	1945
8. International Telecommunication Union (ITU)	Geneva, Switzerland	1947
9. UN Educational, Scientific and Cultural Organization	Paris, France	1945
10. United Nations Industrial Development Organization	Vienna, Austria	1967
11. United Nations World Tourism Organization (UNWTO)	Madrid, Spain	1974
12. Universal Postal Union (UPU)	Bern, Switzerland	1947
13. World Bank Group (WBG)	Washington DC, USA	1945
14. World Food Program (WFP)	Rome, Italy	1963
15. World Health Organization (WHO)	Geneva, Switzerland	1948
16. World Intellectual Property Organization (WIPO)	Geneva, Switzerland	1974
17. World Meteorological Organization (WMO)	Geneva, Switzerland	1950



## B. SAARC

The South Asian Association for Regional Cooperation (SAARC) is an economic and geopolitical organization of eight countries that are primarily located in South Asia. The SAARC Secretariat is based in Kathmandu, Nepal which was established on 16 January 1987 and was inaugurated by Late King Birendra Bir Bikram Shah of Nepal. The combined economy of SAARC is 3rd largest in the world in the terms of GDP (PPP) after the United States and China, and 8th largest in the terms of nominal GDP. SAARC nations comprise 3% of the world's area and in contrast having 21% of the world's total population. India makes up over 70% of the area and population among these eight nations.



The idea of regional political and economical cooperation in South Asia was first raised in May 2, 1980 by Zia Ur Rahaman and the first summit was held in Dhaka on 8 December 1985, when the organization was established by the governments of Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka. Since then the organization has expanded by accepting one new member, Afghanistan, and several observer members. The SAARC policies aim to promote welfare economics, collective self-reliance among the countries of South Asia, and to accelerate socio-cultural development in the region. The SAARC has developed external relations by establishing permanent diplomatic relations with the EU, the UN (as an observer), and other multilateral entities. The official meetings of the leaders of each nation are held annually even as the foreign ministers meet twice annually. The 18th SAARC Summit was held in Kathmandu from 26-27 November 2014.

### Regional Centers of SAARC

The SAARC Secretariat is supported by following Regional Centers established in Member States to promote regional co-operation. These Centers are managed by Governing Boards comprising representatives from all the Member States, SAARC Secretary General and the Ministry of Foreign/External Affairs of the Host Government. The Director of the Centre acts as Member Secretary to the Governing Board which reports to the Programming Committee.

- SAARC Agricultural Centre (SAC), Dhaka, Bangladesh
- SAARC Meteorological Research Centre (SMRC), Dhaka, Bangladesh
- SAARC Tuberculosis and HIV/AIDS Centre (STAC), Kathmandu, Nepal
- SAARC Documentation Centre (SDC), New Delhi, India

- SAARC Human Resources Development Centre (SHRDC), Islamabad, Pakistan
- SAARC Coastal Zone Management Centre (SCZMC), Maldives
- SAARC Information Centre (SIC), Nepal
- SAARC Energy Centre (SEC), Pakistan
- SAARC Disaster Management Centre (SDMC), India
- SAARC Forestry Centre (SFC), Bhutan
- SAARC Cultural Centre (SCC), Sri Lanka
- SAARC Development Fund, Bhutan

### The Secretaries General of SAARC

SN	Name of the Secretaries General	Period	Country of Origin
1	Abul Hasan	1985-1989	Bangladesh
2	Kant Kishore Bhargava	1989-1991	India
3	Ibrahim Hussein Zaki	1992-1993	Maldives
4	Yadav Kanta Silwal	1994-1995	Nepal
5	Naeem U. Hasan	1996-1998	Pakistan
6	Nihl Rodrigo	1999-2002	Sri Lanka
7	Q.A.M.A. Raihim	2002-2005	Bangladesh
8	Chenkyab Dorji	2005-2008	Bhutan
9	Sheel Kant Sharma	2008-2011	India
10	Fathimath Dhiyana Saeed	2011-2012	Maldives
11	Ahmed Saleem	2012-2014	Maldives
12	Arjun Bahadur Thapa	2014-Present	Nepal

### The SAARC Summits

**1<sup>st</sup>** Summit (7–8 Dec, 1985) was held in Dhaka, Bangladesh; **2<sup>nd</sup>** (16–17 Nov, 1986) in Bengaluru, India; **3<sup>rd</sup>** (2–4 Nov, 1987) in Kathmandu, Nepal; **4<sup>th</sup>** (29–31 Dec, 1988) in Islamabad, Pakistan; **5<sup>th</sup>** (21–23 Nov, 1990) in Male, Maldives; **6<sup>th</sup>** (21 Dec, 1991) in Colombo, Sri Lanka; **7<sup>th</sup>** (10–11 Apr, 1993) Dhaka, Bangladesh; **8<sup>th</sup>** (2–4 May, 1995) in New Delhi, India; **9<sup>th</sup>** (12–14 May 1997) in Male, Maldives; **10<sup>th</sup>** (29–31 Jul, 1998) in Colombo, Sri Lanka; **11<sup>th</sup>** (4–6 Jan, 2002) in Kathmandu, Nepal; **12<sup>th</sup>** (2–6 Jan, 2004) in Islamabad, Pakistan; **13<sup>th</sup>** (12–13 Nov, 2005) in Dhaka, Bangladesh; **14<sup>th</sup>** (3–4 Apr, 2007) in New Delhi, India; **15<sup>th</sup>** (1–3 Aug, 2008) in Colombo, Sri Lanka; **16<sup>th</sup>** (28–29 Apr, 2010) in Thimpu, Bhutan; **17<sup>th</sup>** (10–11 Nov, 2011) in Addu, Maldives; **18<sup>th</sup>** (26-27 Nov, 2014) in Kathmandu, Nepal and **19<sup>th</sup>** to be held in Islamabad, Pakistan.

### C. European Union (EU)

The European Union (EU) is a politico-economic union of 28 member states that are located primarily in Europe. The countries are Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, the United Kingdom and the new members Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia. The EU operates through a system of supranational institutions and intergovernmental negotiated decisions by the member states. The institutions are: the European Commission, the Council of the European Union, the European Council, the Court of Justice of the European Union, the European Central Bank, the Court of Auditors, and the European Parliament. The European Parliament is elected every five years by EU citizens.



The EU traces its origins from the European Coal and Steel Community (ECSC) and the European Economic Community (EEC), formed by the Inner Six countries in 1951 and 1958, respectively. In the intervening years, the community and its successors have grown in size by the accession of new member states and in power by the addition of policy areas to its remit. The Maastricht Treaty established the European Union under its current name in 1993 and introduced the European Citizenship. The EU has developed a single market through a standardized system of laws. Within the Schengen Area, passport controls have been abolished. EU policies aim to ensure the free movement of people, goods, services, and capital, enact legislation in justice and home affairs, and maintain common policies on trade, agriculture, fisheries, and regional development.

The monetary union is currently composed of 19 member states that use the euro as their legal tender. The union maintains permanent diplomatic missions throughout the world and represents itself at the United Nations, the WTO, the G-8, and the G-20. With a combined population of over 500 million inhabitants, or 7.3% of the world population, the EU in 2012 generated a nominal gross domestic product (GDP) of 16.584 trillion US dollars, constituting approximately 23% of global nominal GDP and 20% when measured in terms of purchasing power parity. If it were a country, the EU would come first in nominal GDP and second in GDP (PPP) in the world. Additionally, 26 out of 28 EU countries have a very high Human Development Index, according to the UNDP. In 2012, the EU was awarded the Nobel Peace Prize.

## D. ASEAN

The Association of South East Asian Nations (ASEAN) is a political and economic organization of ten Southeast Asian countries, which was formed on 8 August 1967 by Indonesia, Malaysia, Philippines, Singapore, and Thailand. Since then, membership has expanded to include Brunei, Cambodia, Laos, Myanmar (Burma) and Vietnam. Its aims include accelerating economic growth, social progress, and socio cultural evolution among its members, protection of regional peace and stability, and opportunities for member countries to discuss differences peacefully.



ASEAN was prefigured by an organization called the Association of Southeast Asia (ASA), a group consisting of the Philippines, Malaysia, and Thailand that was formed in 1961. ASEAN itself was inaugurated on 8 August 1967, when foreign ministers of five countries, Indonesia, Malaysia, the Philippines, Singapore, and Thailand, signed the ASEAN Declaration, more commonly known as the Bangkok Declaration. The five foreign ministers, Adam Malik of Indonesia, Narciso Ramos of the Philippines, Abdul Razak of Malaysia, S. Rajaratnam of Singapore, and Thanat Khoman of Thailand, are considered the organization's founding fathers.

ASEAN covers a land area of 4.46 million km<sup>2</sup>, which is 3% of the total land area of earth, and has a population of approximately 600 million people, or 8.8% of the world's population. The sea area of ASEAN is about three times larger than its land counterpart. In 2012, its combined nominal GDP had grown to more than US\$ 2.3 trillion. If ASEAN were a single entity, it would rank as the seventh largest economy in the world, behind the US, China, Japan, Germany, France, and the United Kingdom.

### Purpose of ASEAN

As set out in the ASEAN Declaration, the aims and purposes of ASEAN are:

- To accelerate economic growth, social progress, and cultural development
- To promote regional peace, stability and Southeast Asian studies
- To promote collaboration and mutual assistance on matters of common interest
- To provide assistance to each other in the form of training and research facilities
- To collaborate for the better utilization of agriculture and industry to raise the living standards of the people
- To maintain close, beneficial cooperation with existing international organizations

## E. Questionnaire

1. What was the name of the organization that was established before UNO by considering different countries of the world? – League of Nations
2. When did the UNO come into existence? – January 10th, 1920
3. How many countries were there in the existence period of UNO? – 51
4. Where is the central Office of UNO? – New York, USA
5. Which is the country that used Veto Power in the security council of UNO for the first time? – Britain
6. Which is the first main organization of UNO? – International Labor Organization
7. When did ILO get Peace Nobel Prize? – 1966
8. Who suggested giving the name UNO? – Franklin D. Roosevelt
9. Who is the Secretary General of UNO who died in the plane crash? – Dag Hammarskjold
10. For how many times Nepal become the temporary member of UNO's Security Council? – 2 times
11. Which is the country to use Veto for the highest time? – Russia
12. Which country bears the highest expenses in UNO? – USA
13. Where was the first meeting of UNO held? – West Minister, London
14. How many permanent members do the UNO have? – 5 (USA, UK, Russia, France & China)
15. When did Nepal get the membership of UNO? – 14th December, 1955
16. Which country left the member of UNO? – Indonesia
17. Which country was removed from the member of UNO? – Taiwan
18. What are the Armies of the UNO called? – Blue Helmets
19. Where is the UNO's University? – Tokyo, Japan
20. When was UNO's Flag approved by the General Assembly? – 20th October, 1947
21. When and where was the Charter of UNO signed? – 26th June 1945, San Francisco
22. Which SAARC country organized the council of ministers meeting at the foothills of Mt. Everest? – Nepal
23. When the SAARC did formally established? – 8th December, 1985
24. How many countries are the member countries of the SAARC? – 8
25. Who is the concept profounder of SAARC University? – Indian PM Dr. Manmohan Singh (13th SAARC Summit, Dhaka 2005)

26. Which is the SAARC country that provides the free education from primary to university level study? – Sri Lanka
27. What is the full form of SAFTA? – South Asian Free Trade Area
28. When was the first SAARC summit held? – Dhaka, Bangladesh
29. Which is the smallest country of SAARC? – Maldives (298 Sq. Km)
30. Which are the SAARC summits hosted by Nepal till today? – Third, Eleventh and Eighteenth
31. Which is the first SAARC country to ban the use of plastic? – Bangladesh
32. How many articles does the SAARC charter have? – 10 articles
33. Which SAARC country which has no written constitution? – Bhutan
34. Which is the only one SAARC country which has no any river? – Maldives
35. When did Afghanistan get the membership of SAARC? – 4th April, 2007
36. Who designed the Logo of SAARC? – Shailendra Maharjan (Nepal)
37. Which SAARC country has the biggest museum in Asia? – Mumbai, India
38. Which country organized the SAARC meeting under the ocean? – Maldives
39. When was the SAARC Youth Year celebrated? – 1994
40. When was the SAARC Polio Day celebrated? – 1997
41. Who has signed the SAARCs Charter from Nepal's side? – King Birendra
42. Who is the first person to take part in SAARC Conference by representing head of Nepal's government? – Krishna Prasad Bhattarai
43. When was the first SAARC Business Fare held? – 1996, New Delhi
44. Which country had presented the proposal to put headquarter of SAARC in Nepal? – Pakistan
45. Which SAARC country has the lowest literacy rate? – Afghanistan
46. Which country has the lowest population among the SAARC countries? – Maldives
47. What was the slogan for 18th SAARC Summit held in Kathmandu, Nepal? – 'Deeper Integration for Peace and Prosperity'
48. As which year did SAARC observed for 2005? – South Asian Tourism Year
49. Who was given the SAARC award for the first time? – Ziyaurrahman (Nov. 2005)
50. Where is the SAARC Tuberculosis Alleviation Centre? – Bhaktapur, Nepal

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After the sale of this book, 10% of the author's benefited amount will be donated for the betterment of children of Baby Life Home, Bhatkepati, Kathmandu.



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