

BIOLOGY

REFERENCE STUDY MATERIAL

for
Summative Assessment -II

CLASS – IX

2016 – 17

**CHAPTER WISE CONCEPTS, FORMULAS AND
QUESTIONS INCLUDING HOTS QUESTIONS**

Prepared by

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PREFACE

It gives me great pleasure in presenting the Study Material in Biology for Summative Assessment (SA) - II. It is in accordance with the syllabus of the session 2016–17 for second term (CCE pattern).

Each chapter has a large number of questions along with all concepts and descriptions of topics in such a simple style that even the weak students will be able to understand the topic very easily. The most important feature of this material is that **NCERT book questions(intext questions) and exercises** included along with answers.

Keeping the mind the mental level of a child, every effort has been made to introduce simple questions in starting before HOTS questions so that the child solve them easily and gets confidence.

I avail this opportunity to convey my sincere thanks to respected sir, Shri U. N. Khaware, Additional Commissioner(Acad), KVS Headquarter, New Delhi, respected sir, Shri S. Vijay Kumar, Joint Commissioner(Admn), KVS Headquarter, New Delhi, respected sir Shri P. V. Sairanga Rao, Deputy Commissioner(Acad), KVS Headquarter, New Delhi, respected sir Shri. D. Manivannan, Deputy Commissioner, KVS RO Hyderabad, respected sir Shri Isampal, Deputy Commissioner, KVS RO Bhopal, respected sir Shri Jagdish Mohan Rawat, Director, KVS ZIET Chandigarh, respected sir Shri P. Deva Kumar, Deputy Commissioner, KVS RO Bangalore, respected sir Shri Nagendra Goyal, Deputy Commissioner, KVS RO Ranchi, respected sir Shri Y. Arun Kumar, Deputy Commissioner, KVS RO Agra, respected sir Shri Sirimala Sambanna, Assistant Commissioner, KVS RO Hyderabad, respected sir Shri. K. L. Nagaraju, Retd-AC, KVS RO Bangalore and respected sir Shri M.K. Kulshreshtha, Retd-AC, KVS RO Chandigarh for their blessings, motivation and encouragement in bringing out this project in such an excellent form.

I also extend my special thanks to respected sir Shri. P. S. Raju, Principal, KV Gachibowli, respected madam Smt. Nirmala Kumari M., Principal, KV Mysore & respected sir Shri. M. Vishwanatham, Principal, KV Raichur for their kind suggestions and motivation while preparing this Question Bank. I would like to place on record my thanks to respected sir Shri. P. K. Chandran, Principal, presently working in KV Bambolim. I have started my career in KVS under his guidance, suggestions and motivation.

Inspite of my best efforts to make this notes error free, some errors might have gone unnoticed. I shall be grateful to the students and teacher if the same are brought to my notice. You may send your valuable suggestions, feedback or queries through email to kumarsir34@gmail.com that would be verified by me and the corrections would be incorporated in the next year Question Bank.

M. S. KUMARSWAMY

ISAMPAL
DEPUTY COMMISSIONER



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Dated:05.09.2013

Dear Shri M.S.Kumarswamy,

It has been brought to my notice the good work done by you with regard to making question bank and worksheets for classes VI to X in Mathematics. I am pleased to look at your good work. Mathematics is one discipline which unfortunately and wrongly perceived as a phobia. May be lack of motivation from teachers and inadequate study habits of students is responsible for this state of affairs. Your work in this regard assumes a great significance. I hope your own students as well as students of other Vidyalayas will benefit by your venture. You may mail the material to all the Kendriya Vidyalayas of the region for their benefit. Keep up the good work.

May God bless!,

Yours sincerely,



(Isampal)

Shri M.S.Kumarswamy
TGT (Maths)
Kendriya Vidyalaya
Donimalai

Copy to: the principals, Kendriya Vidyalayas, Bangalore Region with instructions to make use of the materials prepared by Mr. M.S.Kumarswamy being forwarded separately.

**DEDICATED
TO
MY FATHER**

LATE SHRI. M. S. MALLAYYA

CHAPTER – 7

DIVERSITY IN LIVING ORGANISMS

CLASSIFICATION

Biodiversity: The variety of living beings found in geographical area is called biodiversity of that area. Amazon rainforests is the largest biodiversity hotspot in the world.

Need for Classification: Classification is necessary for easier study of living beings. Without proper classification, it would be impossible to study millions of organisms which exist on this earth.

BASIS OF CLASSIFICATION

Ancient Greek thinker Aristotle classified living beings on the basis of their habitat. He classified them into two groups, i.e. those living in water and those living on land. But his classification was too simple to justify inclusion of a particular organism into a particular group.

Some examples of scientific bases of classification are as follows:

Organization of nucleus: Nucleus may or may not be organized in an organism. On this basis, organisms can be divided into two groups, viz. prokaryotes and eukaryotes.

(a) Prokaryotes:

When nucleus is not organized, i.e. nuclear materials are not membrane bound; the organism is called prokaryote.

(b) Eukaryotes:

When nucleus is organized, i.e. nuclear materials are membrane bound; the organism is called eukaryote.

Number of cells: An organism can be composed of a single cell or many cells. An organism with a single cell is called unicellular organism. On the other hand, an organism with more than one cell is called multicellular organism.

Mode of Nutrition

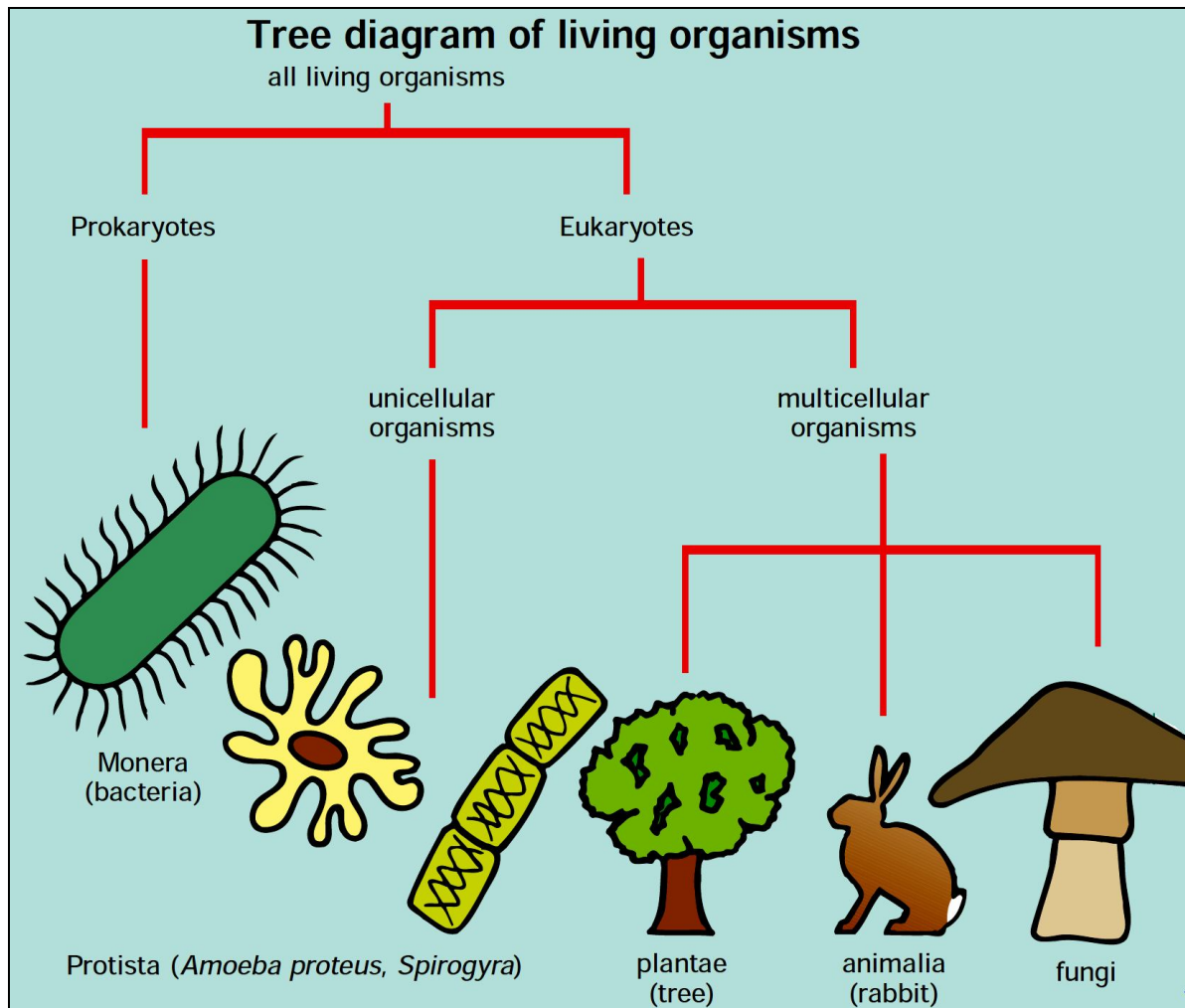
On this basis, organisms can be divided into two broad groups, i.e. autotrophs and heterotrophs. An autotroph makes its own food, while a heterotroph depends on other organisms for food.

Level of Organisation

Even in case of multicellular organisms, there can be different levels of organization. When a cell is responsible for all the life processes, it is called cellular level or organization. When some cells group together to perform specific function, it is called tissue level of organization. When tissues group together to form some organs, it is called organ level of organization. Similarly organ system level of organization is seen in complex organisms.

Classification and Evolution

It is a well established fact that all the life forms have evolved from a common ancestor. Scientists have proved that the life begun on the earth in the form of simple life forms. During the course of time, complex organism evolved from them. So, classification is also based on evolution. A simple organism is considered to be primitive while a complex organism is considered to be advanced.

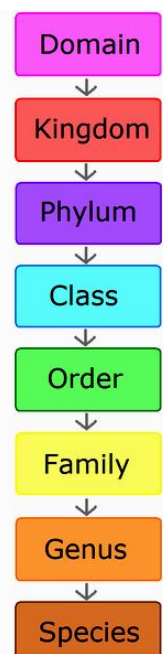


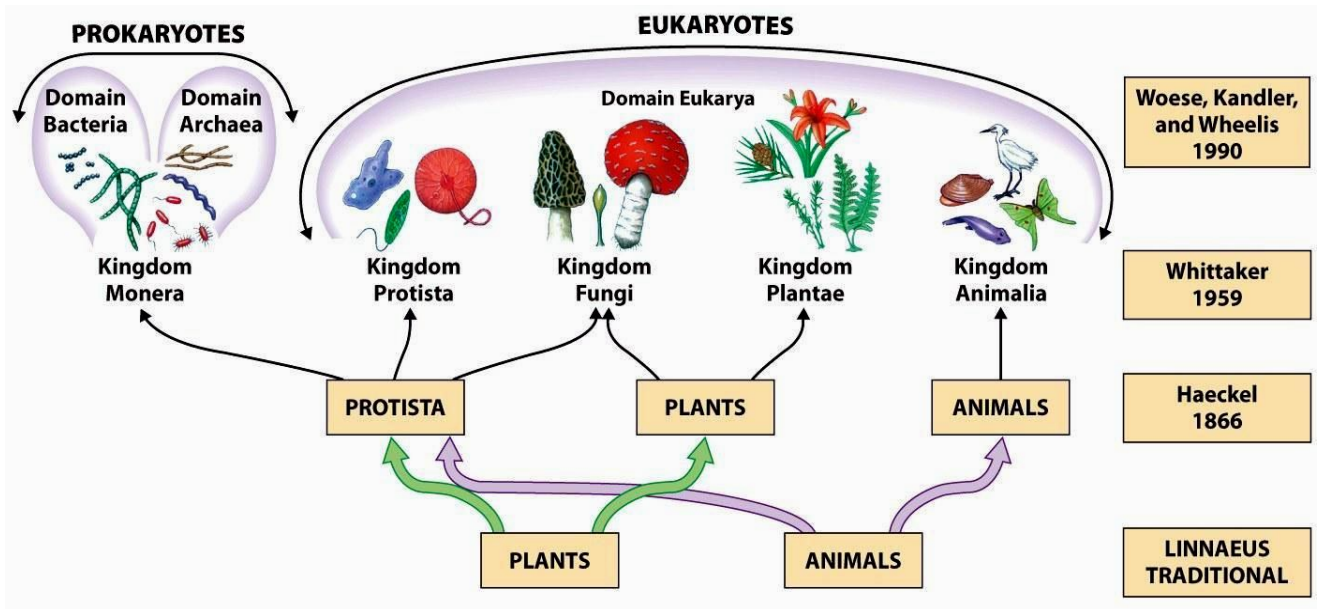
FIVE KINGDOM CLASSIFICATION BY ROBERT WHITTAKER (1959)

This is the most accepted system of classification.

The classification Whittaker proposed has five kingdoms: Monera, Protista, Fungi, Plantae and Animalia, and is widely used. These groups are formed on the basis of their cell structure, mode and source of nutrition and body organisation. Further classification is done by naming the sub-groups at various levels as given in the following scheme:

Thus, by separating organisms on the basis of a hierarchy of characteristics into smaller and smaller groups, we arrive at the basic unit of classification, which is a 'species'. The important characteristics of the five kingdoms of Whittaker are as follows:



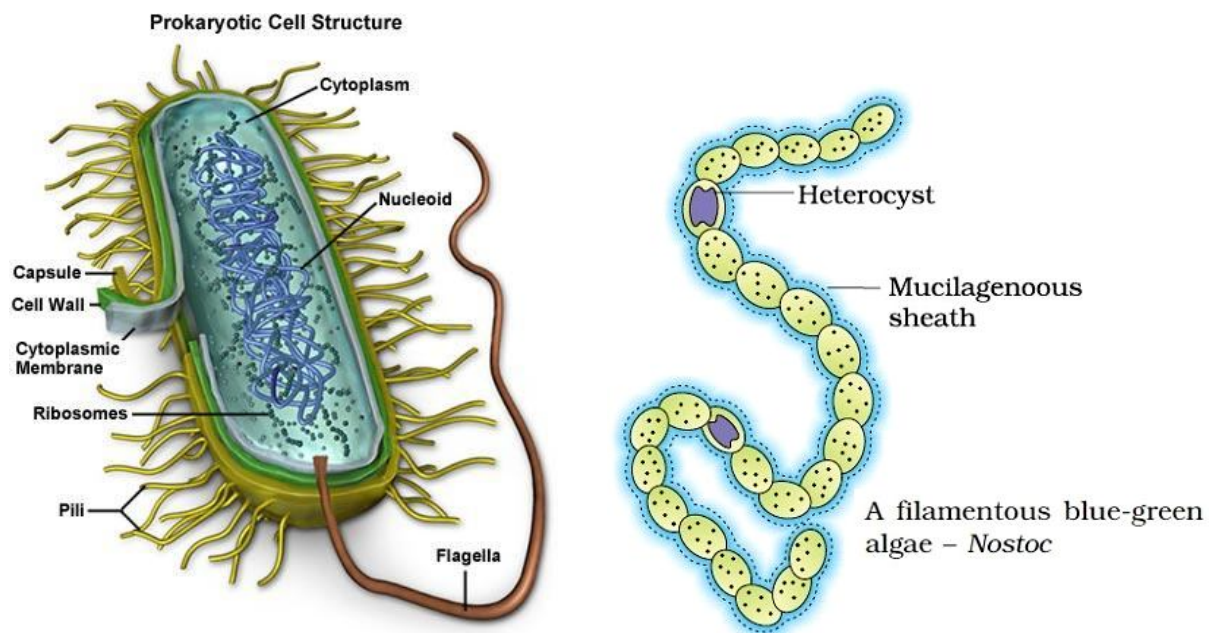


1. MONERA

These are prokaryotes; which means nuclear materials are not membrane bound in them. They may or may not have cell wall.

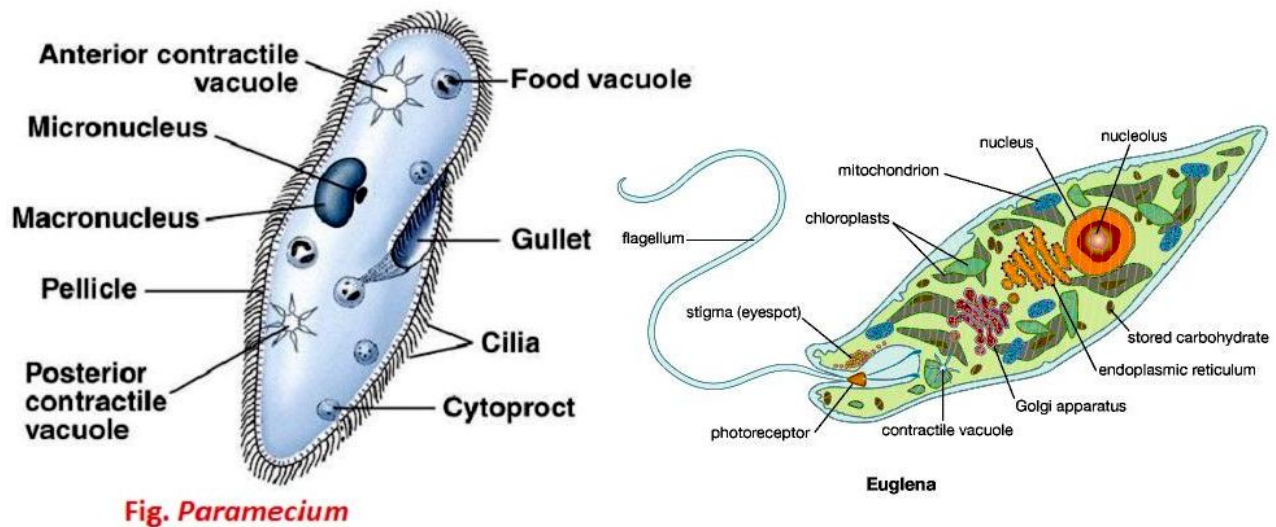
The mode of nutrition of organisms in this group can be either by synthesising their own food (autotrophic) or getting it from the environment (heterotrophic).

All organisms of this kingdom are unicellular. Examples: bacteria, blue green algae (cyanobacteria) and mycoplasma.



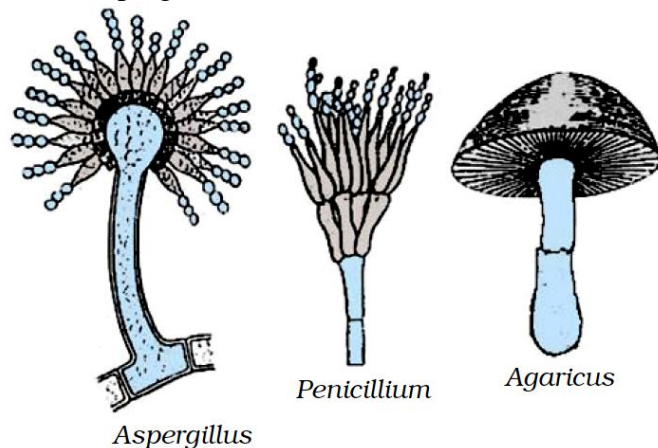
2. PROTISTA

These are eukaryotes and unicellular. Some organisms use cilia or flagella for locomotion. They can be autotrophic or heterotrophic. Examples: unicellular algae, diatoms and protozoans.



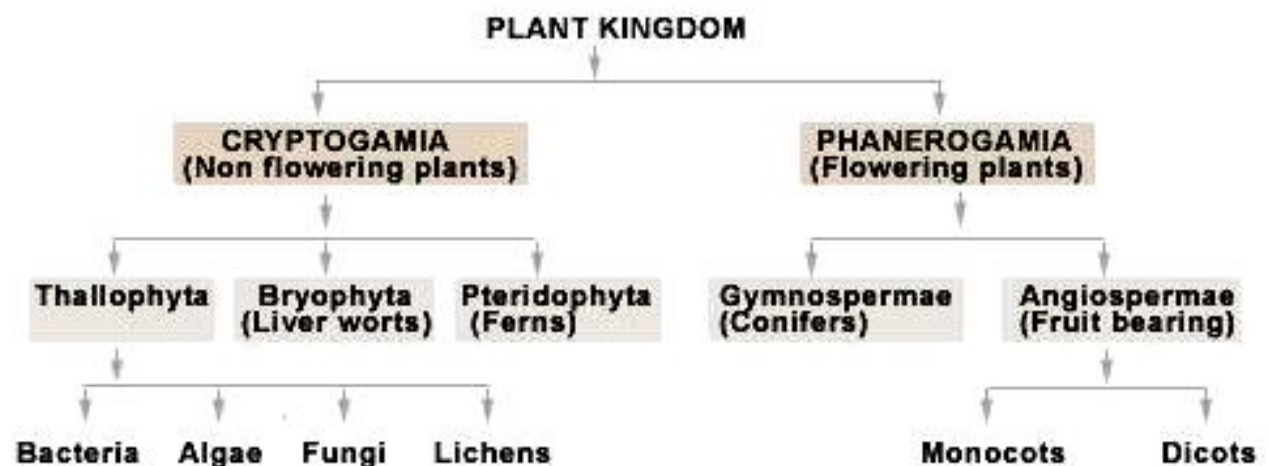
3. FUNGI

These are heterotrophic and have cell wall. The cell wall is made of chitin. Most of the fungi are unicellular. Many of them have the capacity to become multicellular at certain stage in life. They feed on decaying organic materials. Such a mode of nutrition is called saprophytic. Some fungi live in symbiotic relationship with other organisms, while some are parasites as well. Examples: yeast, penicillium, aspergillus, mucor, etc.



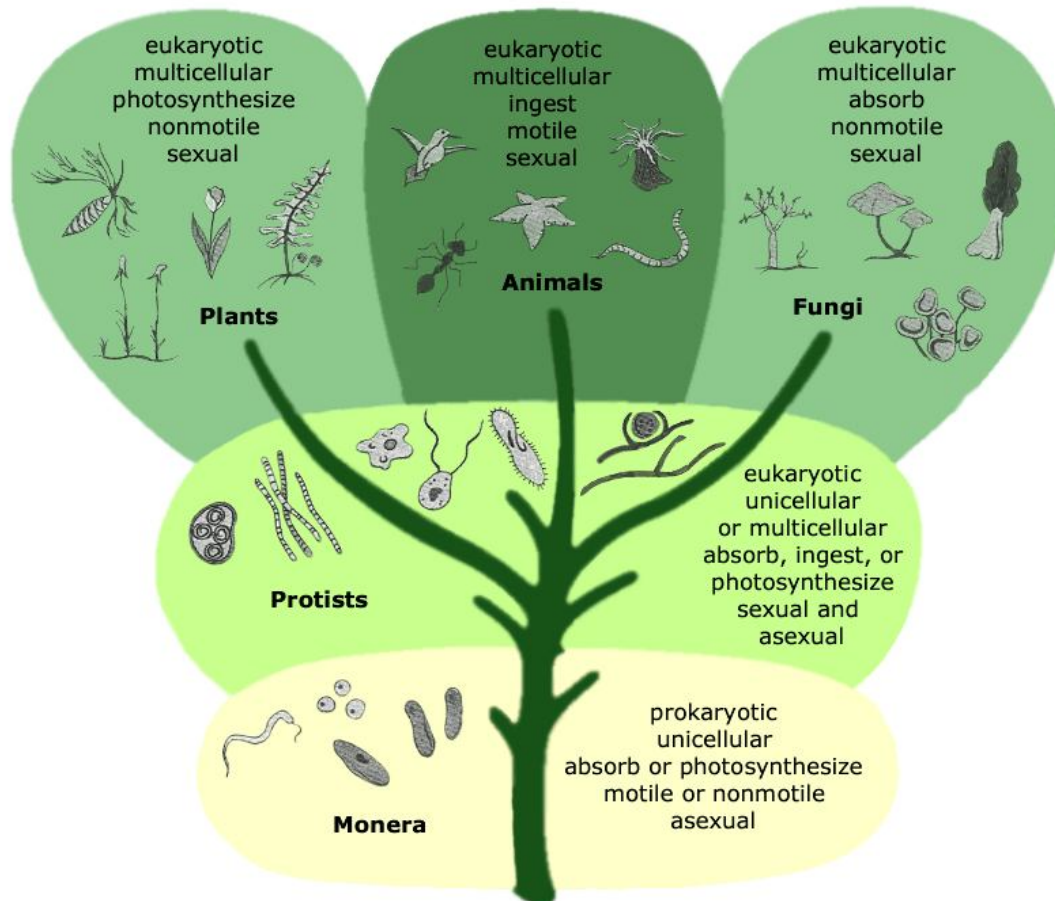
4. PLANTAE

These are multicellular and autotrophs. Presence of chlorophyll is a distinct characteristic of plants, because of which they are capable of doing photosynthesis. Cell wall is present.



5. ANIMALIA

These are multicellular and heterotrophs. Cell wall is absent.



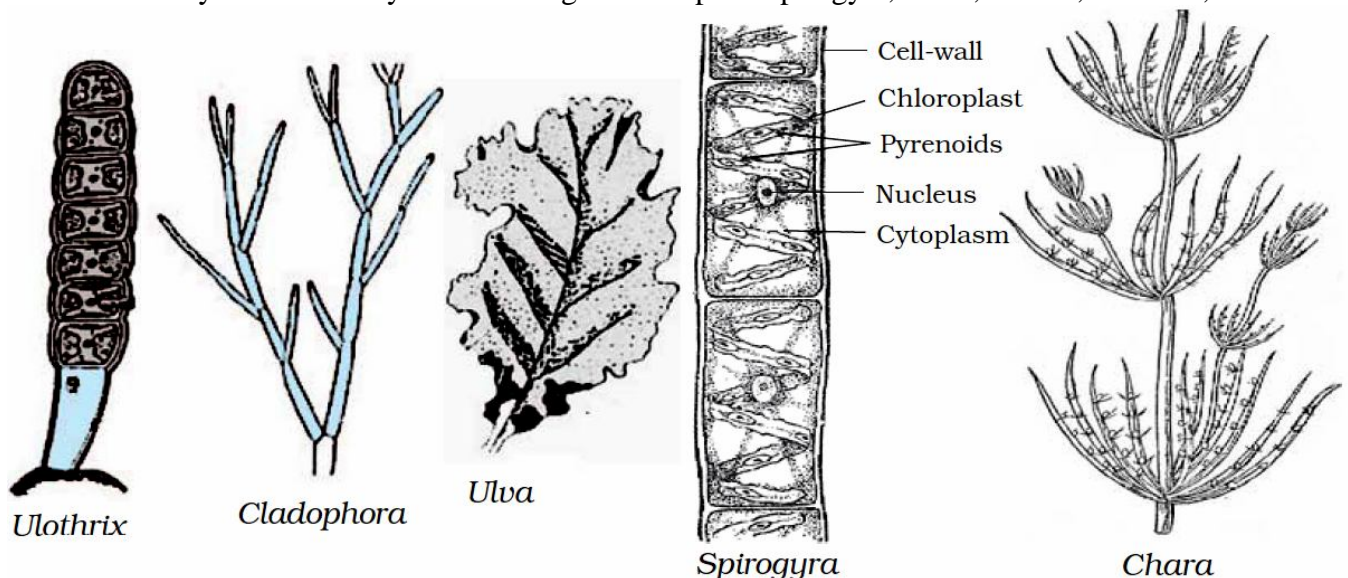
The Five-kingdom System of Classification

PLANTAE (PLANT KINGDOM)

The Plant Kingdom can be further classified into five divisions. Their key characteristics are given below:

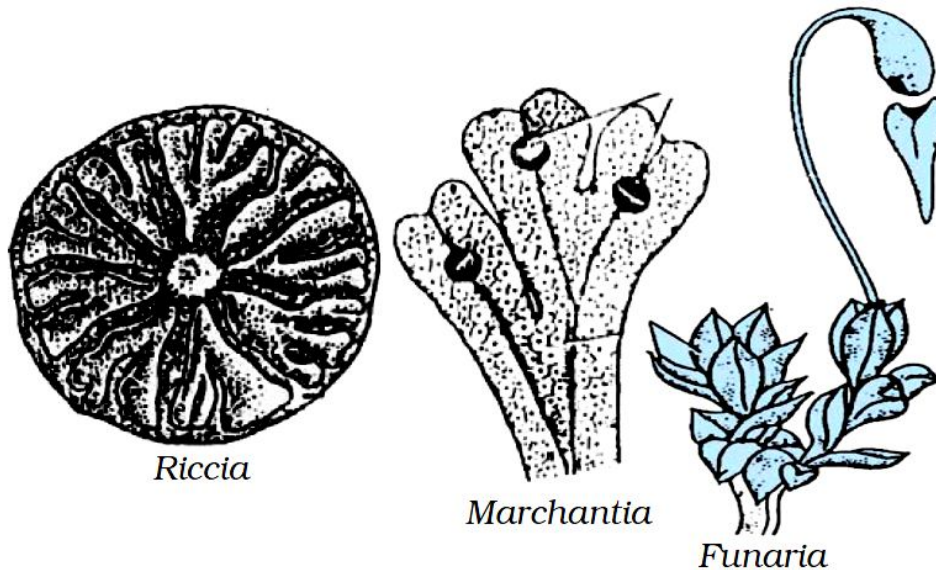
1. THALLOPHYTA

The plant body is simple thallus type. The plant body is not differentiated into root, stem and leaves. They are commonly known as algae. Examples: Spirogyra, chara, volvox, ulothrix, etc.



2. BRYOPHYTA

Plant body is differentiated into stem and leaf like structure. Vascular system is absent, which means there is no specialized tissue for transportation of water, minerals and food. Bryophytes are also known as the amphibians of the plant kingdom, because they need water to complete a part of their life cycle. Examples: Moss, marchantia.



3. PTERIDOPHYTA

Plant body is differentiated into root, stem and leaf. Vascular system is present. They do not bear seeds and hence are called cryptogams. Plants of rest of the divisions bear seeds and hence are called phanerogams. Examples: Marsilear, ferns, horse tails, etc.

The **primary root is short-lived** and is soon replaced by **adventitious roots**

Stem may be aerial or underground.

The **leaves** may be scaly (*Equisetum*),
simple and sessile (*Lycopodium*)
or large and pinnately compound (*Ferns*).

The leaves in pteridophyta are small(**microphylls**) as in *Selaginella* or large(**macrophylls**) as in *Ferns*.

In pteridophytes, the xylem consists of only **tracheids** and phloem consists of **sieve cells** only.

Secondary growth is not seen in Pteridophytes due to **absence of cambium**.



4. GYMNOSPERMS

They bear seeds. Seeds are naked, i.e. are not covered. The word 'gymnos' means naked and 'sperma' means seed. They are perennial plants. Examples: Pine, cycas, deodar, etc.

The plant body i.e. sporophyte is differentiated into root, stem and leaves

ROOTS :

Specialized **Coralloid roots of *Cycas*** show association with N_2 -fixing blue-green algae and

Pinus show association with **endophytic fungi called mycorrhizae**

STEM :

The gymnospermic **stem** is mostly erect, aerial, solid and cylindrical.

In *Cycas*, it is **unbranched**, while in

Pinus, *Cedrus* and *conifers* it is **branched**

LEAVES :

The **leaves** are dimorphic.

The **foliage leaves** are simple, needle like or pinnately compound

Scale leaves are small, membranous and brown.



5. ANGIOSPERMS

The seeds are covered. The word ‘angios’ means covered. There is great diversity in species of angiosperm. Angiosperms are also known as flowering plants, because flower is a specialized organ meant for reproduction. Angiosperms are further divided into two groups, viz. monocotyledonous and dicotyledonous.

Most advanced division of the flowering plants

Highly evolved plants, primarily adapted to terrestrial habitat.

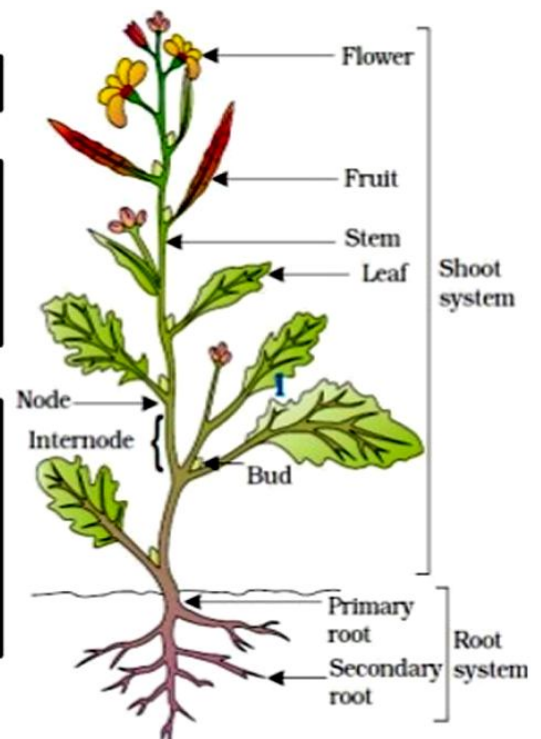
Wolffia is the **smallest** angiosperm, 1 mm in size and *Eucalyptus* grows to over 100 meters.

The plant body is differentiated into **root, stem and leaves**.

It has **flowers, fruits and seeds**.

Vascular tissues are well developed.

Xylem shows **vessels or tracheae** while phloem has **sieve tubes and companion cells**.



(a) Monocotyledonous

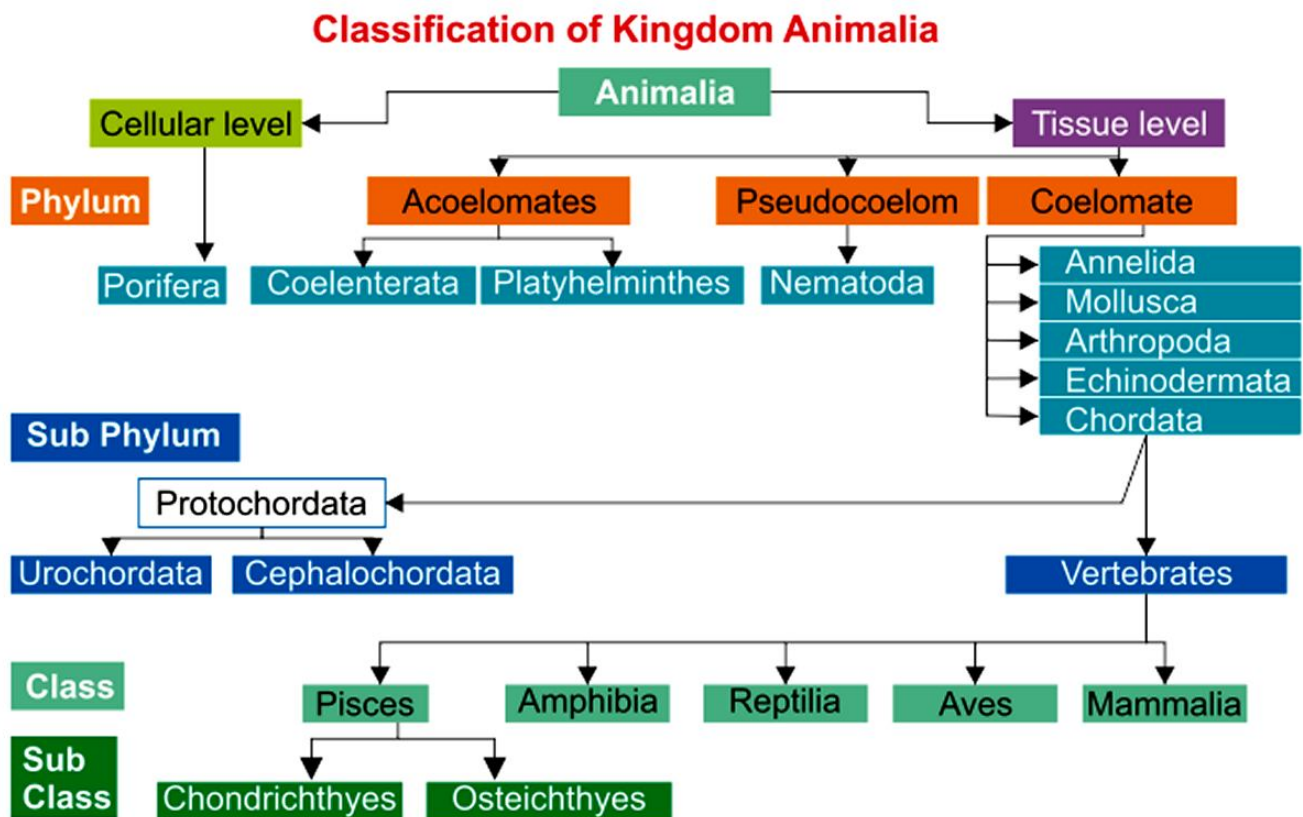
There is single seed leaf in a seed. A seed leaf is a baby plant. Examples: wheat, rice, maize, etc.

(b) Dicotyledonous

There are two cotyledons in a seed. Examples: Mustard, gram, mango, etc.

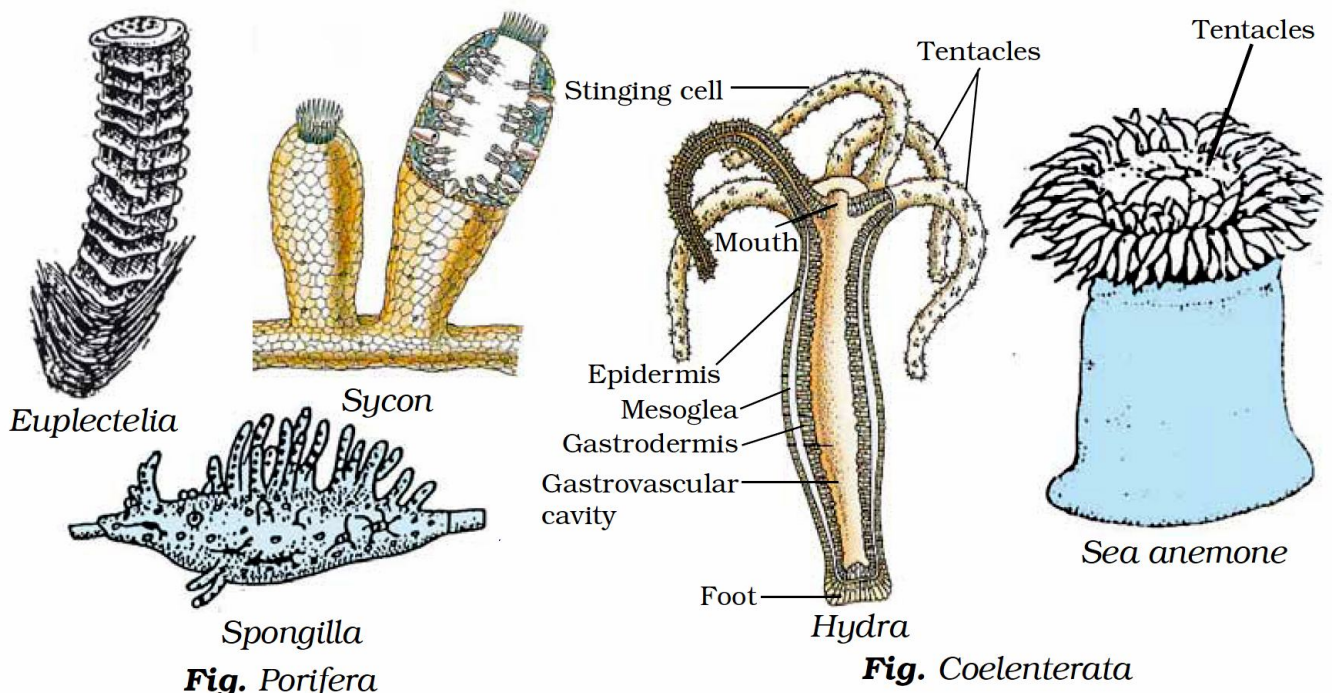
KINGDOM ANIMALIA

The animal kingdom is classified into different phyla. Their detail is given below:



1. PORIFERA

These animals have pores all over their body. The pores lead into the canal system. Water flows through the canal system and facilitates entry of food and exchange of other materials. The animal is not differentiated into tissues. The body is covered with a hard outer skeleton. These are commonly known as sponges. They are marine animals. Examples: Sycon, spongilla, euplectelea, etc.



2. COELENTERATA

The body is made up of a coelom (cavity) with a single opening. The body wall is made up of two layers of cells (diploblastic). Some of the species live a solitary life while others live in colonies. Examples: Hydra, Jelly fish, Sea anemone, etc.

3. PLATYHELMINTHES

The body is flattened from top to bottom and hence the name platyhelminthes. These are commonly known as flatworms. The body wall is composed of three layers of cells (triploblastic). Because of three layers, it is possible to form some organs as well. But a proper coelom is absent in platyhelminthes and hence proper organs are absent. They are free-living or parasitic animals. Examples: Planaria, liver fluke, tapeworm, etc.

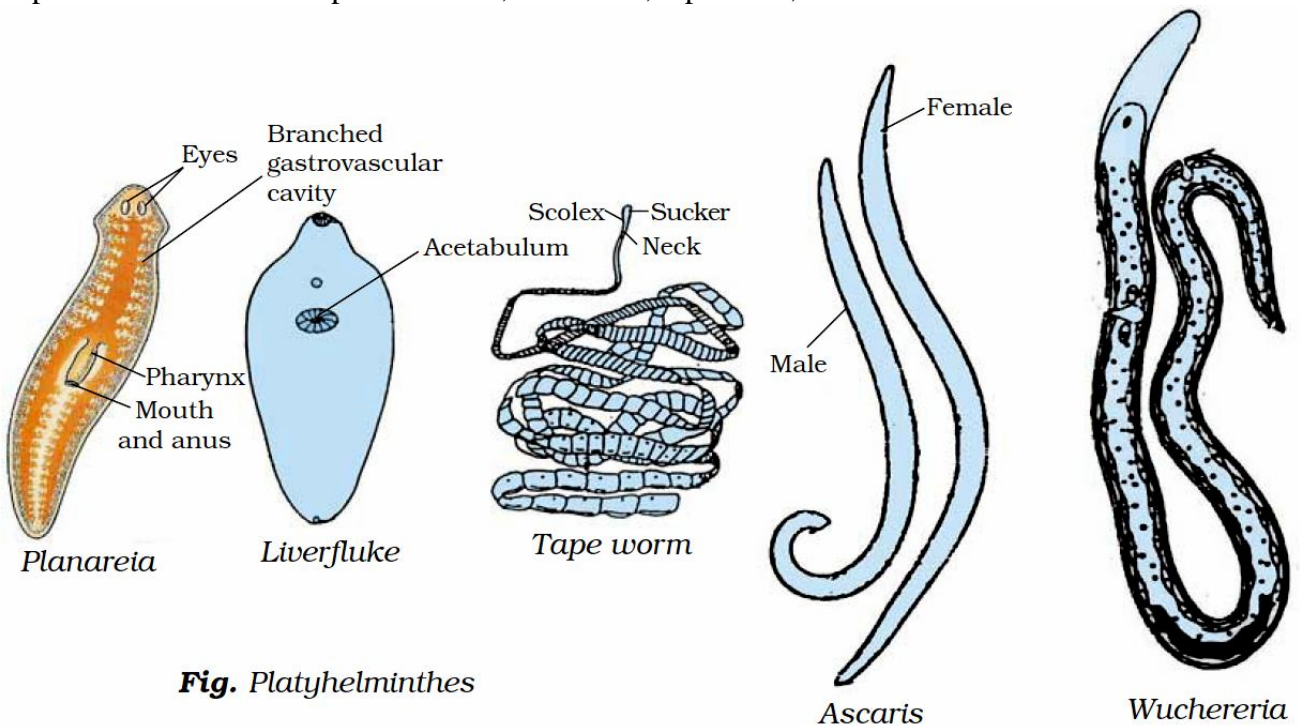


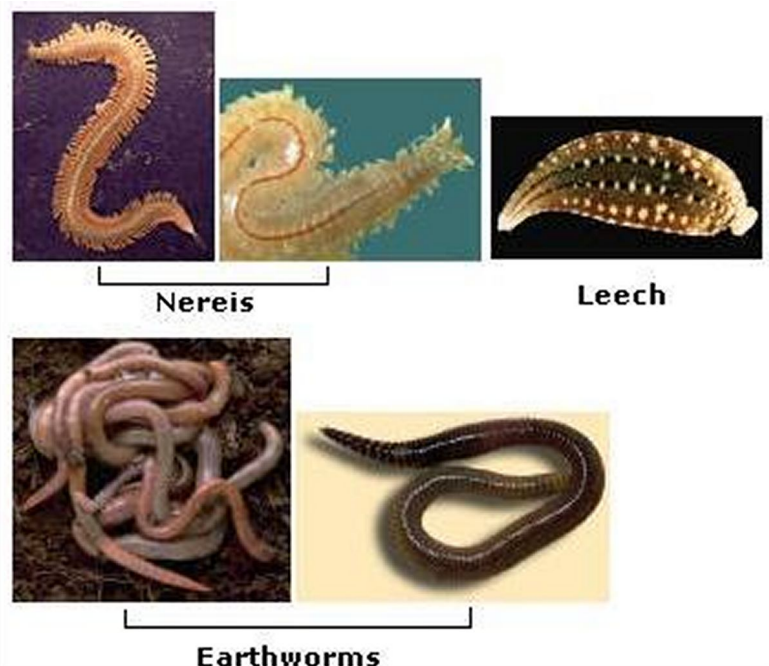
Fig. Nematodes (Aschelminthes)

4. NEMATHELMINTHES

The body is bilaterally symmetric and there are three layers in the body wall. Animals are cylindrical in shape. A pseudocoelom is present and hence organs are absent. Examples: Roundworms, pinworms, filarial parasite (Wuchereria), etc.

5. ANNELIDA

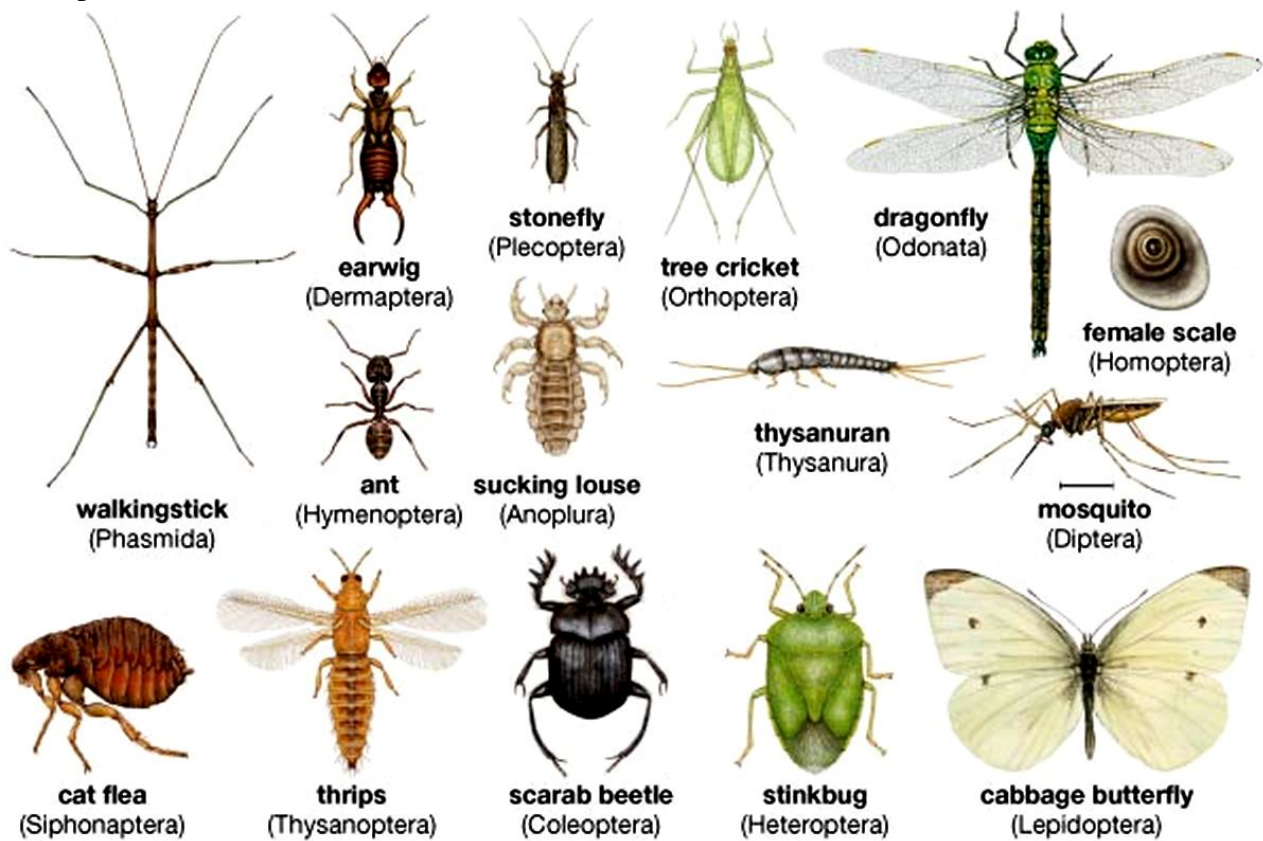
True body cavity is present in these animals. The body is divided into segments and hence the name annelida. Each segment is lined one after another and contains a set of organs. Examples: Earthworm, leech, Nereis, etc.



6. ARTHROPODA

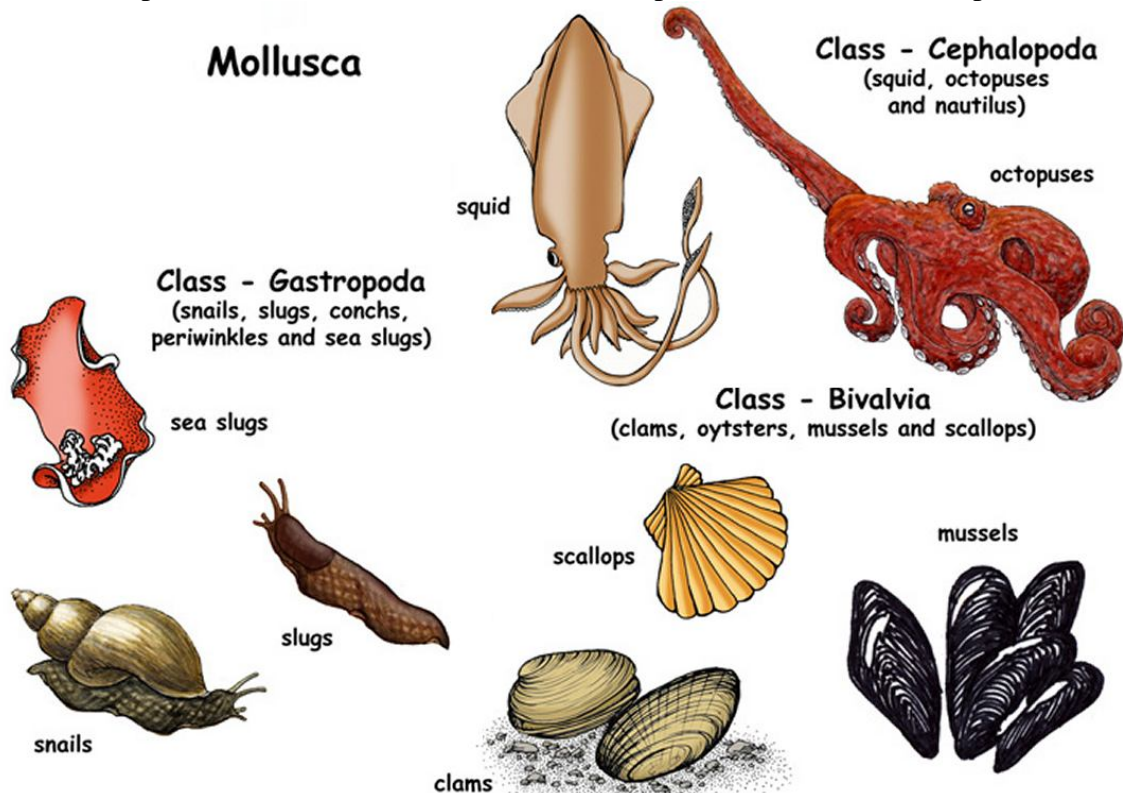
Animals have jointed appendages which gives the name arthropoda. Exoskeleton is present which is made of chitin. This is the

largest group of animals; in terms of number of species. Circulatory system is open, which means blood flows in the coelomic cavity. Examples: cockroach, housefly, spider, prawn, scorpion, etc.



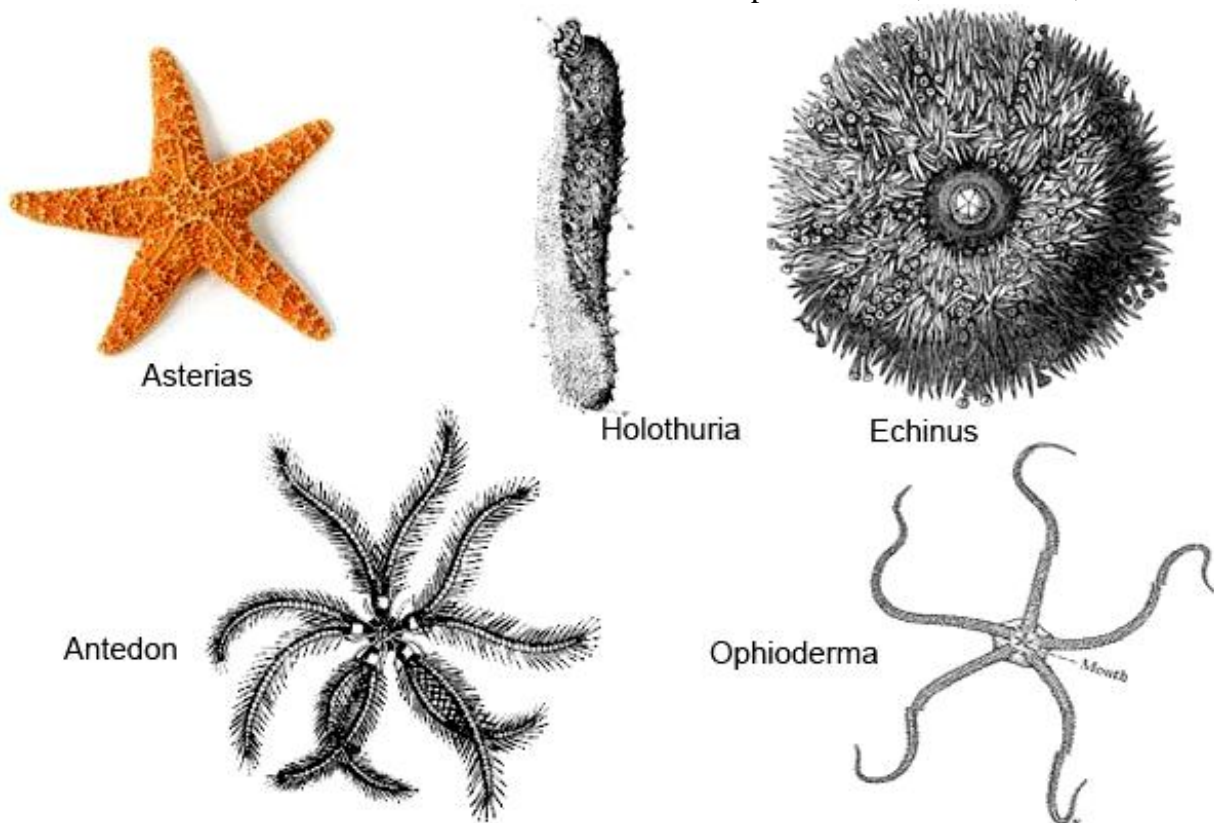
7. MOLLUSCA

The animal has soft body; which is enclosed in a hard shell. The shell is made of calcium carbonate. Circulatory system is open and kidney like organ is present for excretion. The body has well developed muscular feet for locomotion. Examples: Snail, mussels, octopus, etc.



8. ECHINODERMATA

The body is covered with spines, which gives the name echinodermata. Body is radially symmetrical. The animals have well developed water canal system, which is used for locomotion. Skeleton is made of calcium carbonate. Examples: Starfish, sea urchins, etc.



9. PROTOCHORDATA

Animals are bilaterally symmetrical, triploblastic and coelomate. Notochord is present at least at some stages of life. Notochord is a long rod-like structure which runs along the back of the animal. This provides attachment points for muscles. It also separates the nervous tissues from the gut. Examples: Balanoglossus, herdmania, amphioxus, etc.

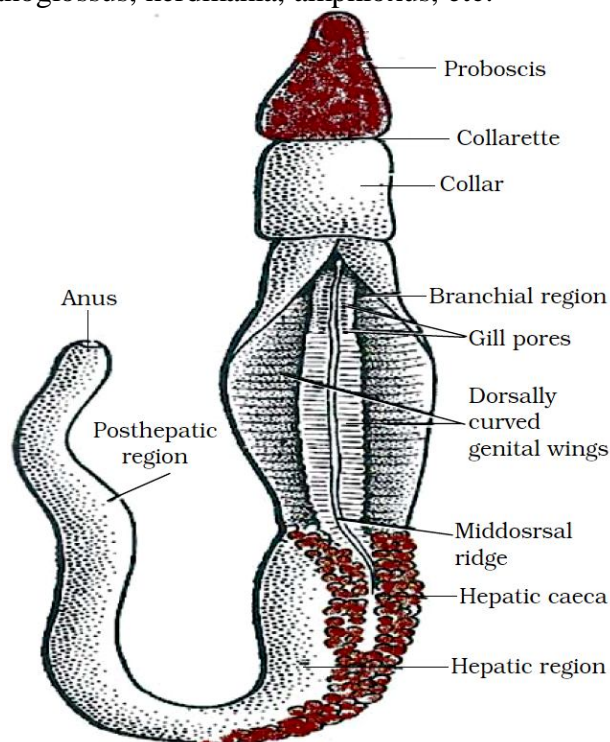


Fig. A Protochordata: *Balanoglossus*

10. VERTEBRATA:

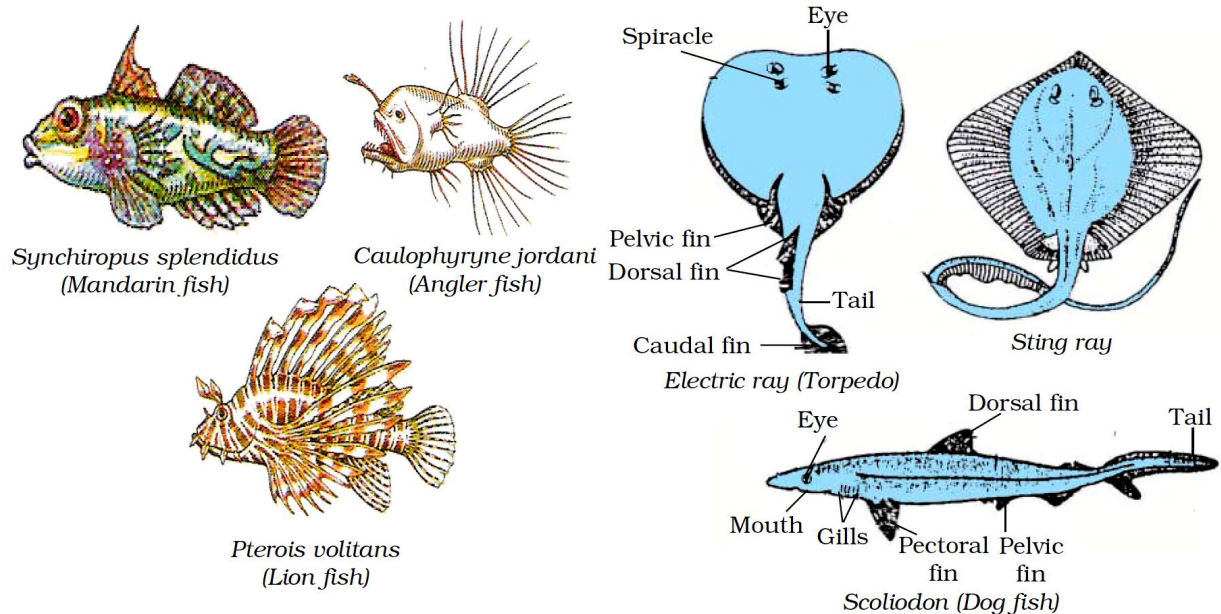
The notochord is replaced by a spinal column during embryonic stage. Following are the main characteristics of vertebrates:

- Notochord present; which is replaced by spinal column.
- Dorsal nerve chord is present.
- Animals are triploblastic and coelomate.
- Animals have paired gill pouches.

Vertebrates are divided into two super classes, viz. pisces and tetrapoda.

A. PISCES

They are commonly known as fish. The body is streamlined. Muscular tail is present which assists in locomotion. Body is covered with scales. Paired gills are present; which can breathe oxygen dissolved in water. They are cold-blooded animals. The heart has only two chambers. They lay eggs. Fishes can be bony or cartilaginous. Shark is an example of cartilaginous fish. Rohu and katla are examples of bony fish.

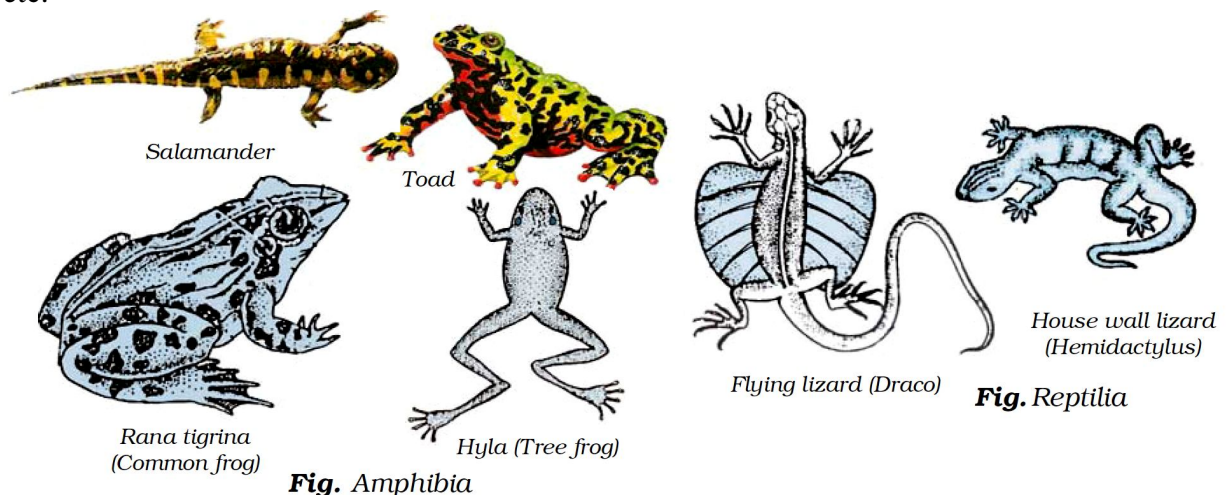


B. TETRAPODA

Animals have four limbs for locomotion and hence the name tetrapoda. Tetrapoda is divided into four classes, viz. amphibia, reptilia, aves and mammalia.

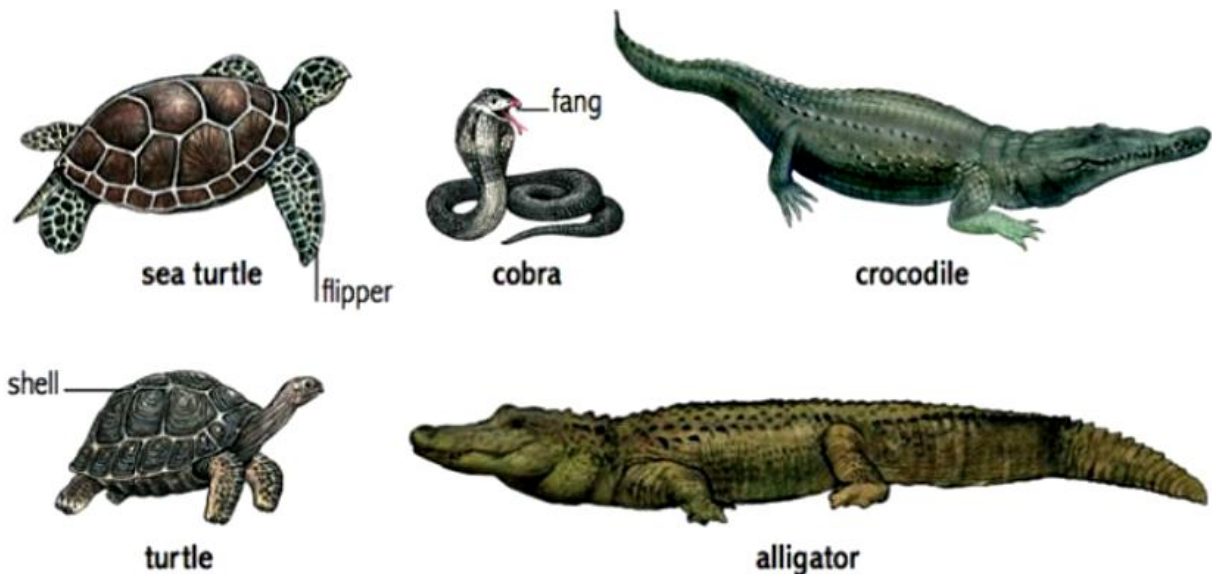
(1) Amphibia:

These animals are adapted to live both in water and land. Mucus glands on skin keep the skin moist. The animals breathe through skin when in water and through lungs when on land. The heart has three chambers. These are cold blooded animals. Examples: Frog, toad, salamander, etc.



(2) Reptilia:

These animals show crawling movement for locomotion. Skin is hardened to form scales. Most of the reptilians have three chambered heart but crocodile has four-chambered heart. They don't need water to lay eggs, rather eggs are covered with hard shells and laid on land. Examples: snakes, lizards, crocodile, turtle, etc.



(3) Aves:

The body is covered with feathers. Forelimbs are modified into wings. These are warm-blooded animals. The heart has four chambers. Bones are hollow (pneumatic); which assists in flying. All the birds belong to this class.

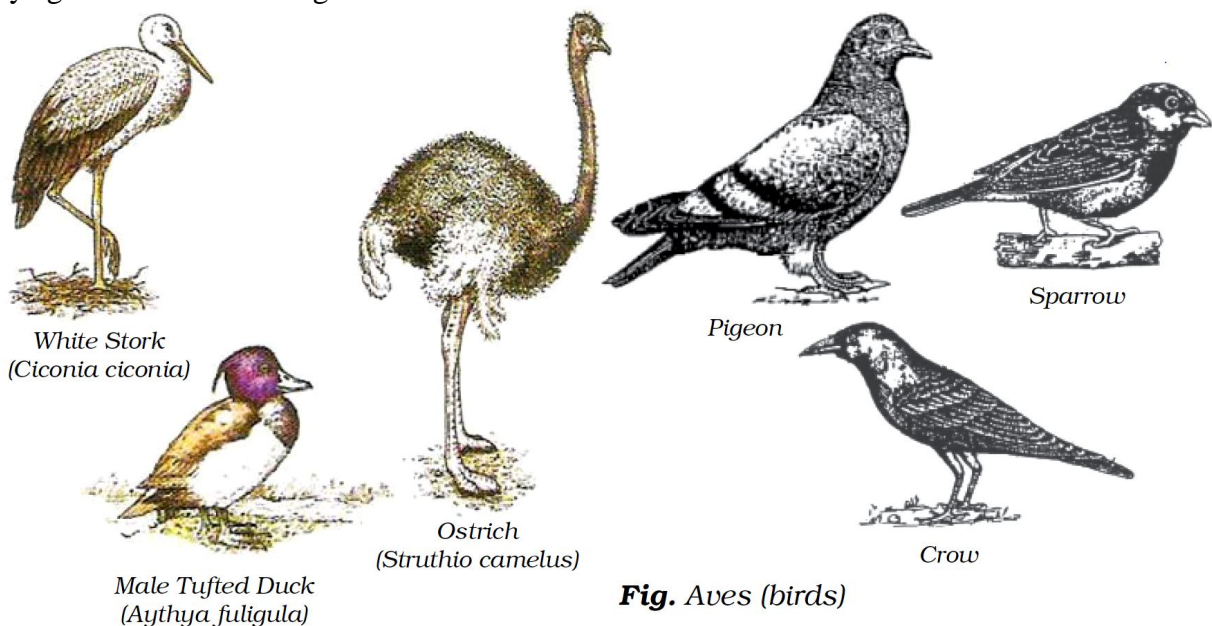
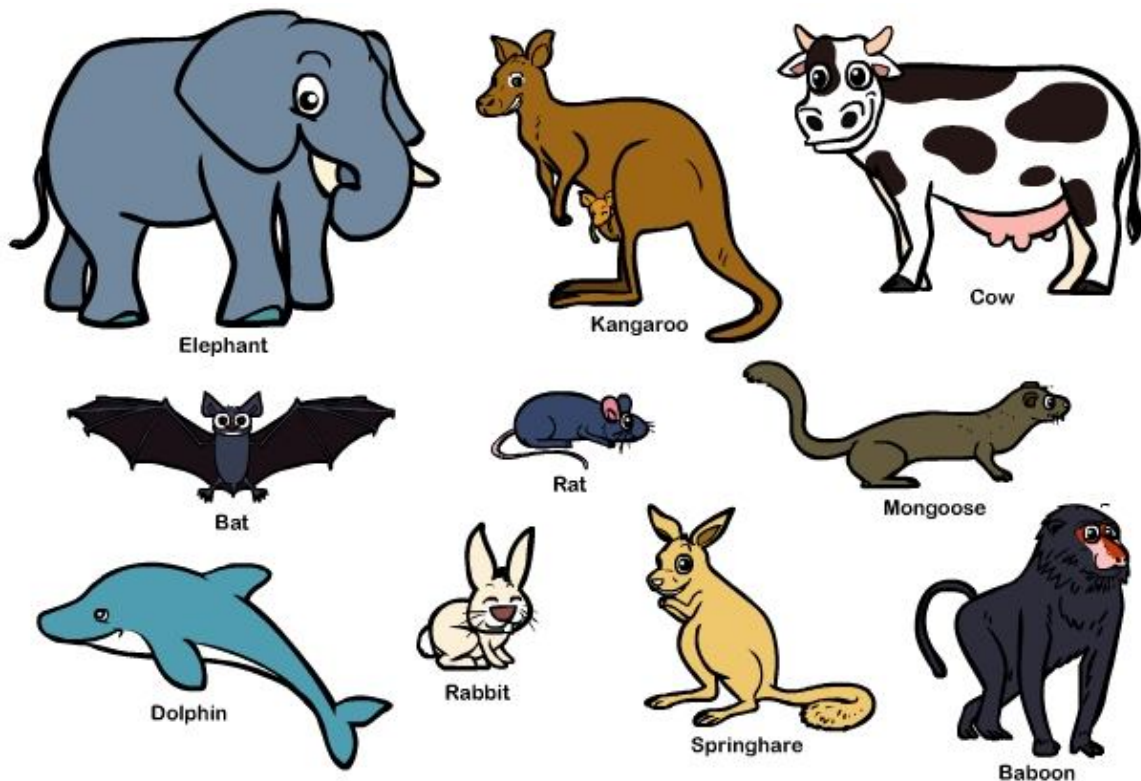


Fig. Aves (birds)

(4) Mammalia:

The body is covered with hairs. Skin has sweat glands and sebaceous glands. Mammary glands are present in females and are used for nourishing the young ones. Most of the mammals give birth to young ones and are called viviparous. Some of the mammals lay eggs and are called oviparous. Examples: human, chimpanzee, lion, platypus, horse, etc.



BINOMIAL NOMENCLATURE OF ORGANISMS:

The system of binomial nomenclature was proposed by Carolus Linneaus (1707 – 1778). Conventions of writing biological name are as follows:

- The biological name is composed of two terms. The first term is called genetic name and the second term is called species name.
- The genus name starts with a capital letter, while the species name starts with a small letter.
- In print, the scientific name is written in italics.
- When handwritten, the genus name and species name need to be underlined separately.

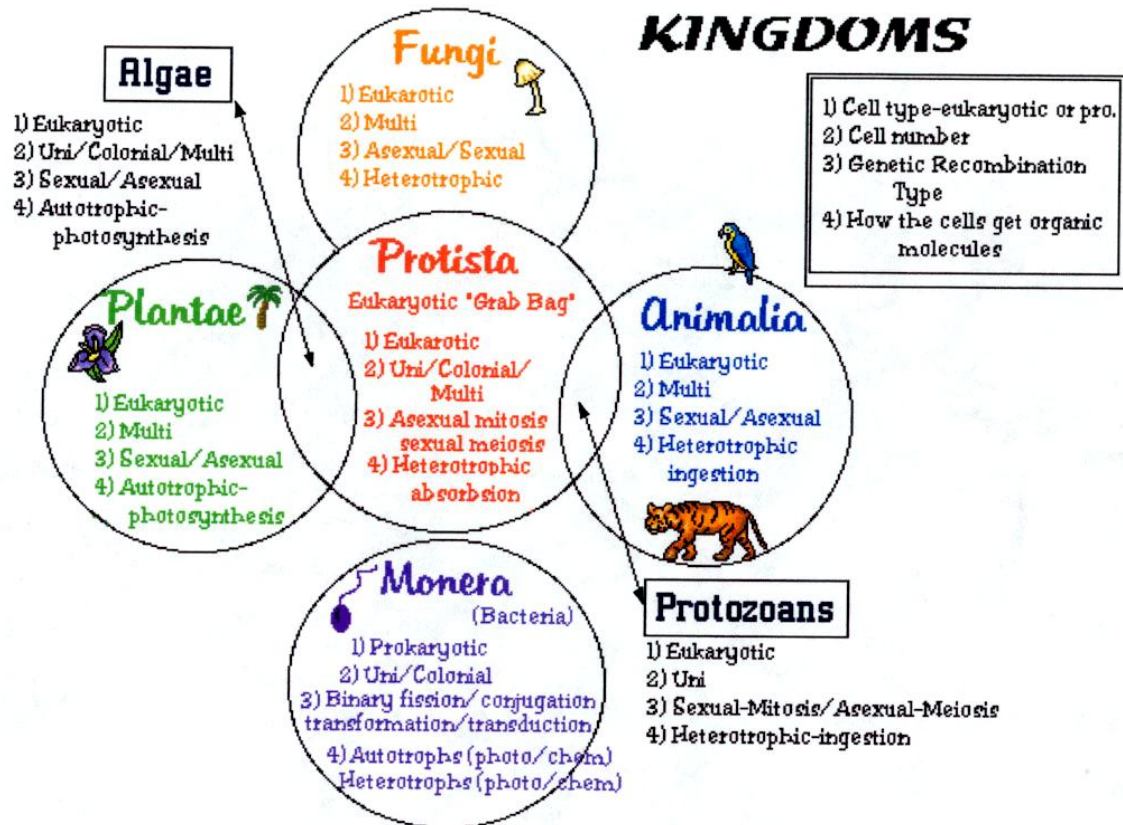
Kingdom	Animalia	Animalia	Animalia
Phylum	Chordata	Chordata	Arthropoda
Class	Mammalia	Aves	Insecta
Order	Rodentia	Passeriformes	Odonata
Family	Castoridae	Icteridae	Gomphidae
Genus and species	<i>Castor canadensis</i>	<i>Icterus galbula</i>	<i>Gomphus spicatus</i>

- System of assigning scientific/binomial names to organisms designed by Carolus Linneaus in 18th century
- Based on idea that every species has a Latin name, made up of two parts
- First part is the name of the **genus**
- Second part specifies the **species**
- Name should be printed in italics (underlined if hand written) and first part capitalized

Example: Binomial name for Humans is *Homo sapiens*

POINTS TO REMEMBER

FIVE CLASSIFICATION OF KINGDOM



The hierarchy of classification – Groups :-

Living organisms have been broadly classified into five main kingdoms. They are :-

i) Monera ii) Protista iii) Fungi iv) Plantae v) Animalia

Each kingdom has been further classified into smaller sub - groups at various levels as :-

Kingdom

Phylum (for plants) / Division (for animals)

Class

Order

Family

Genus

Species

By arranging organisms on the basis of hierarchy and characteristics into smaller and smaller groups we arrive at the basic unit of classification called species.

Species :- is group of organisms which are similar enough to breed and perpetuate.

PLANT KINGDOM

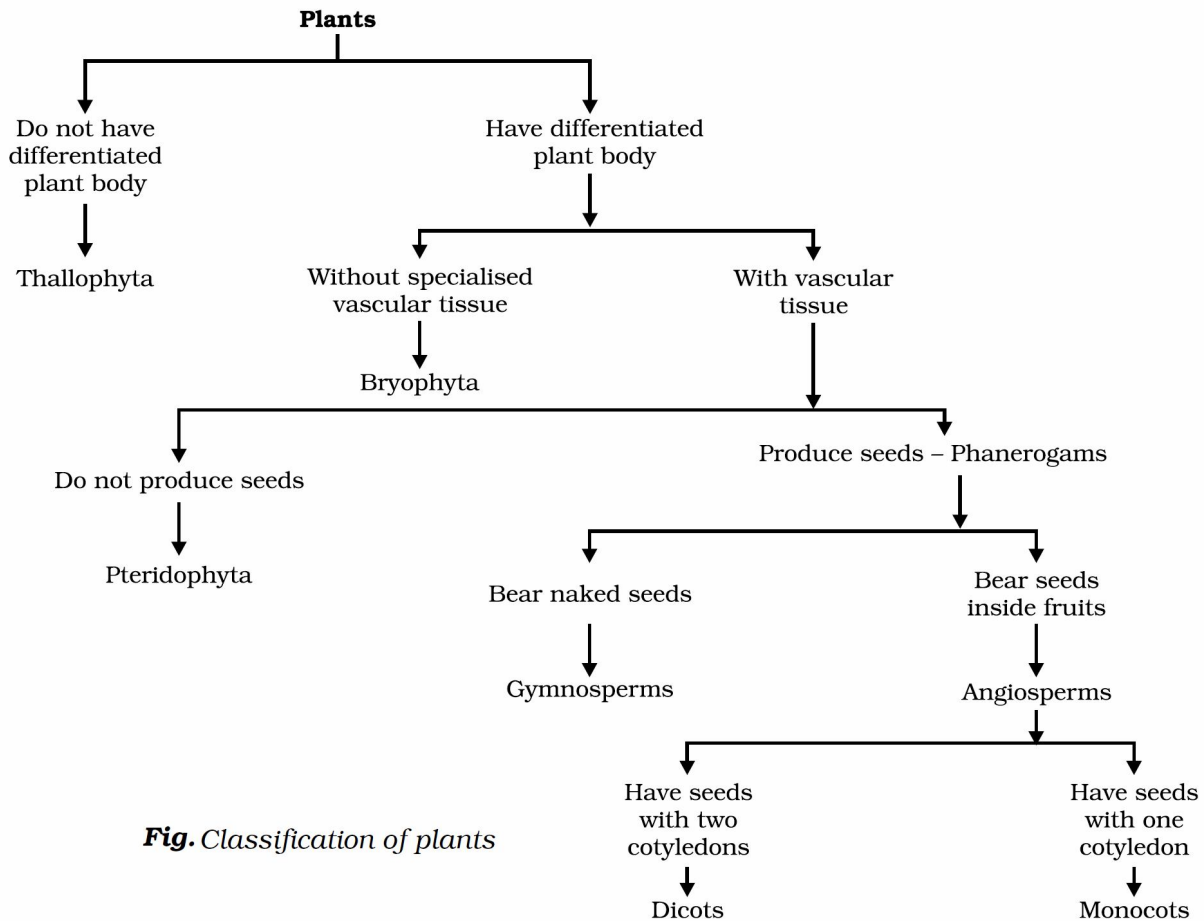
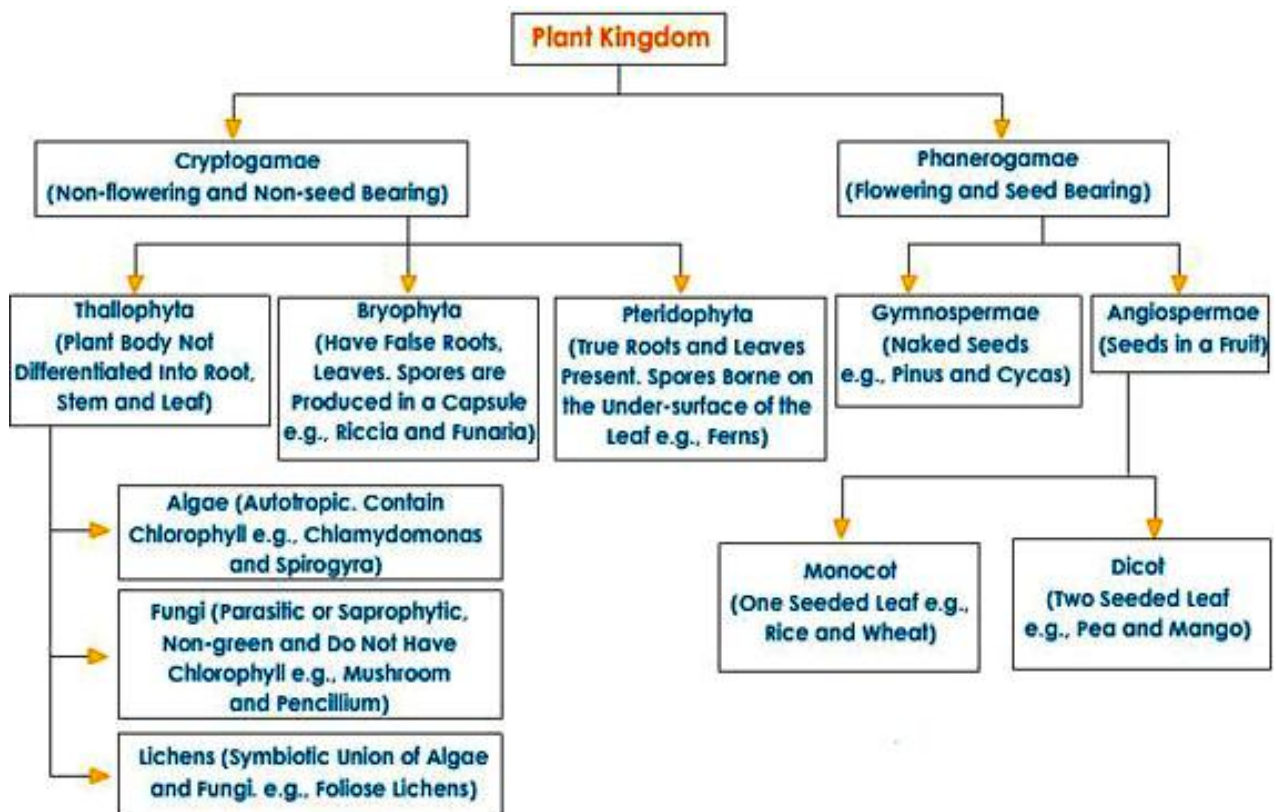
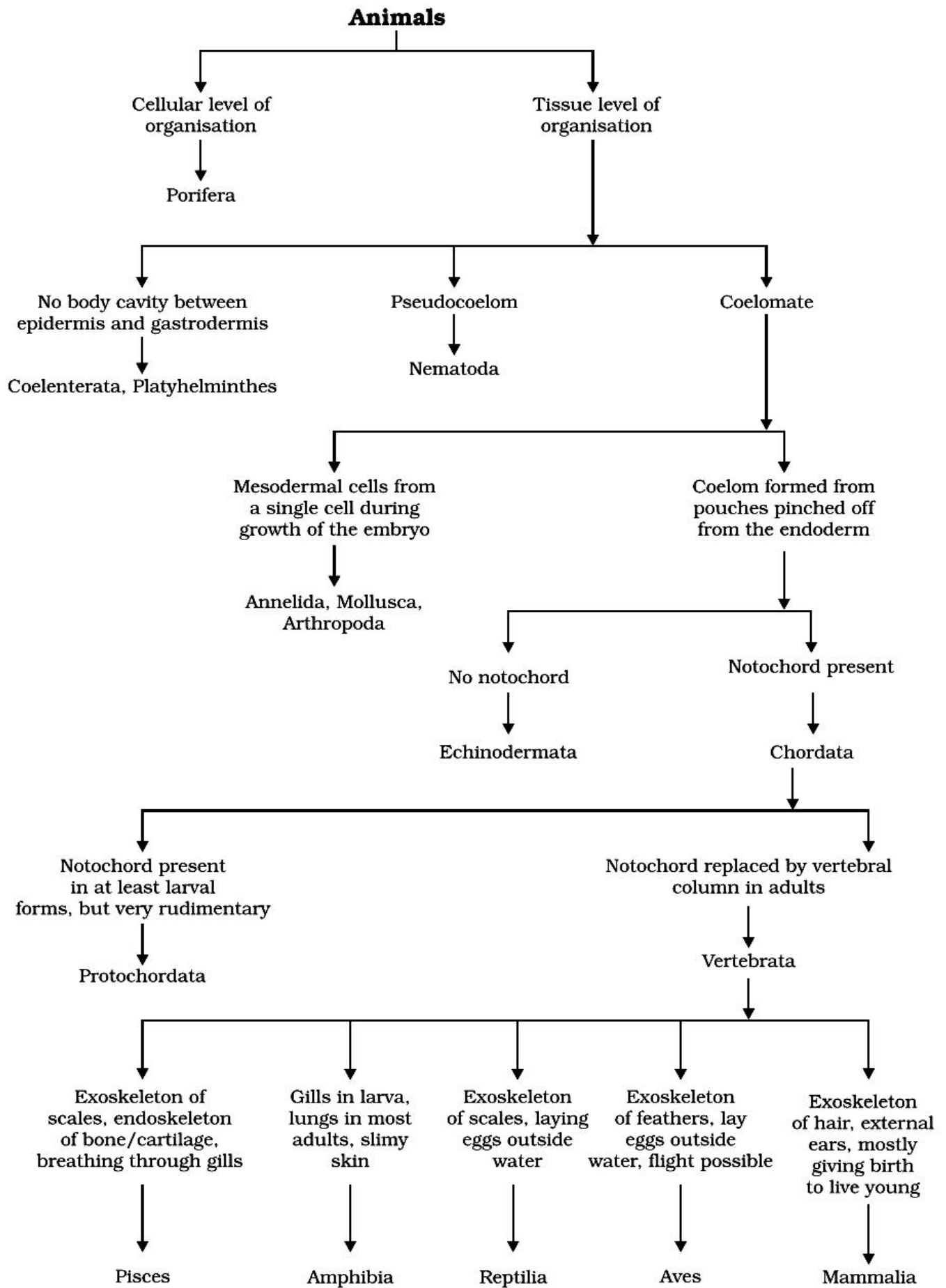


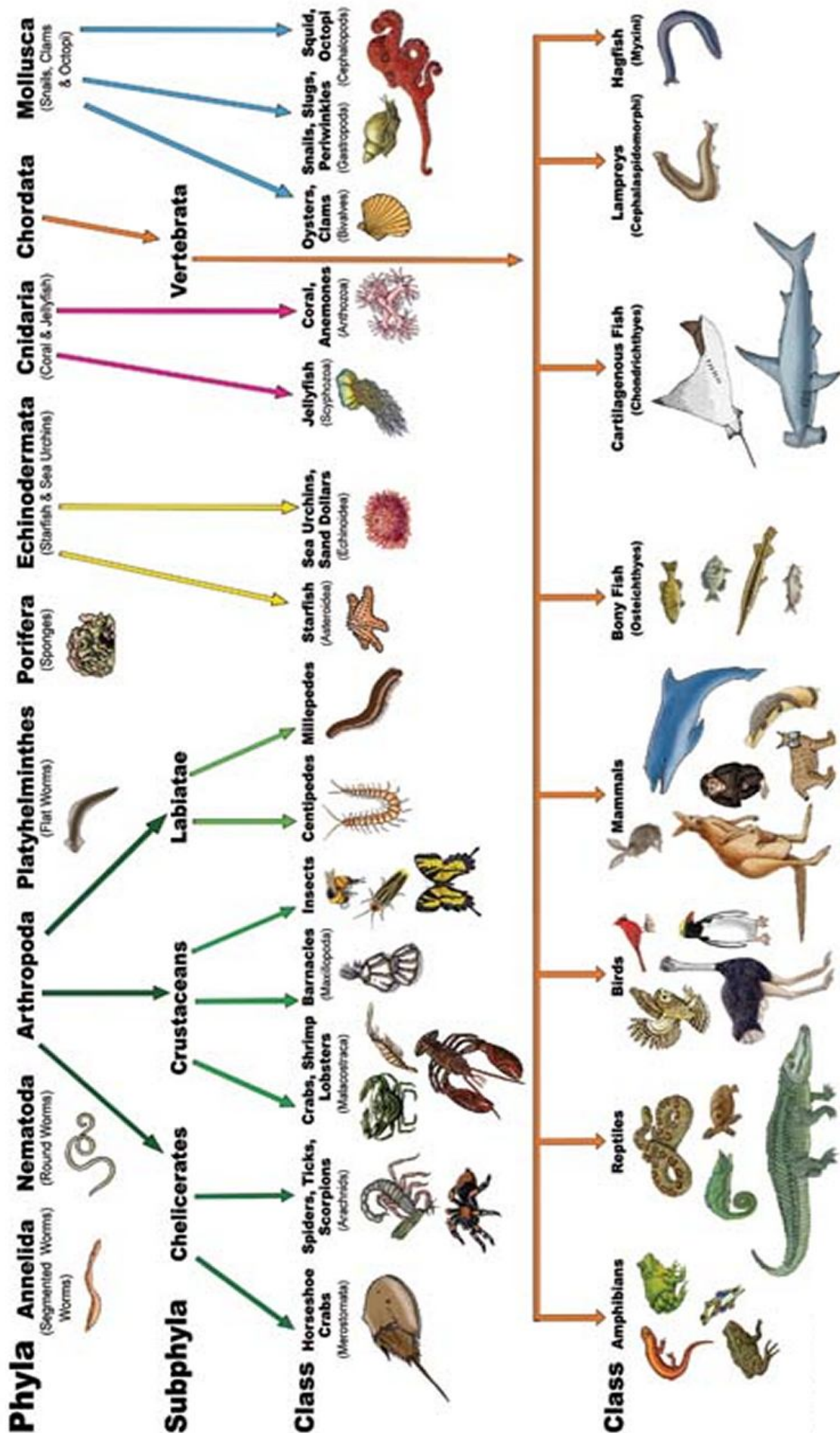
Fig. Classification of plants



ANIMAL KINGDOM



Animal Kingdom



INTEXT QUESTIONS PAGE NO. 82

Q1. Which do you think is a more basic characteristic for classifying organisms?

(a) the place where they live.

(b) the kind of cells they are made of. Why?

Answer: The kind of cells an organism is made of is more basic characteristic of classifying organism because it gives a scientific angle to classification. Moreover, a particular dwelling place can be full of organisms of a wide variety.

Q2. What is the primary characteristic on which the first division of organisms is made?

Answer: Organisation of nucleus is the primary characteristic on which the first division of organisms is made. Based on this, organisms can be either prokaryotic or eukaryotic.

Q3. On what bases are plants and animals put into different categories?

Answer: Plants are autotrophs, while animals are heterotrophs. Cell wall is present in plant cells, while it is absent in animal cells. Plants do not need to move from one place to another, while most of the animals need to move in search of food.

INTEXT QUESTIONS PAGE NO. 83

Q1. Which organisms are called primitive and how are they different from the so-called advanced organisms?

Answer: An organism which is simple is called primitive. On the other hand, an organism with high level of division of labour; by formation of organs and organ system is called advanced.

Q2. Will advanced organisms be the same as complex organisms? Why?

Answer: Complexity in body design evolves because of necessity to adapt according to the changing environment. Hence, a complex organism would be an advanced one; in comparison to a simple organism.

INTEXT QUESTIONS PAGE NO. 85

Q1. What is the criterion for classification of organisms as belonging to kingdom Monera or Protista?

Answer: Organisms which are prokaryotes belong to the kingdom Monera. On the other hand, organisms which are eukaryotes and unicellular belong to the kingdom Protista.

Q2. In which kingdom will you place an organism which is single-celled, eukaryotic and photosynthetic?

Answer: Plant Kingdom

Q3. In the hierarchy of classification, which grouping will have the smallest number of organisms with a maximum of characteristics in common and which will have the largest number of organisms?

Answer: Species will have the smallest number of organisms with a maximum of characteristics in common. On the contrary, kingdom will have the largest number of organisms.

INTEXT QUESTIONS PAGE NO. 88

Q1. Which division among plants has the simplest organisms?

Answer: Thallophyta

Q2. How are pteridophytes different from the phanerogams?

Answer: In pteridophytes, the reproductive organs are hidden and they do not produce seeds. In phanerogams, reproductive organs are conspicuous and they produce seeds.

Q3. How do gymnosperms and angiosperms differ from each other?

Answer: Seeds are naked in gymnosperms, while they are covered in angiosperms. Gymnosperms do not bear flowers, while angiosperms bear flowers.

INTEXT QUESTIONS PAGE NO. 94**Q1. How do poriferan animals differ from coelenterate animals?**

Answer: In porifera, body has numerous pores, which are absent in coelenterates. Body has a cavity in coelenterates, while it is absent in porifera.

Q2. How do annelid animals differ from arthropods?

Answer: Segmented body in annelids, while true segmentation is absent in arthropods. Arthropods have jointed appendages, which are absent in annelids.

Q3. What are the differences between amphibians and reptiles?

Answer: Amphibians need water to lay eggs and fertilization is external. Reptilians do not need water to lay eggs and fertilization is internal. Amphibians use both skin and lungs for breathing. Reptilians breathe through lungs only.

Q4. What are the differences between animals belonging to the Aves group and those in the mammalian group?

Answer: In aves, body is covered with feathers; while in mammals, body is covered with hairs. Mammary glands are absent in aves. Forelimbs of aves are modified into wings which is not the case in mammals. Aves are oviparous, while most of the mammals are viviparous.

EXERCISE QUESTIONS PAGE NO. 43, 44**Q1. What are the advantages of classifying organisms?**

Answer:- There are millions of species on this earth. For anybody, it is impossible to study about each of them in his lifetime. Classification makes it easy to study the organisms; on the basis of certain common characters.

Q2. How would you choose between two characteristics to be used for developing a hierarchy in classification?

Answer:- We need to look at the fact if given character is present in a small number of organisms or a larger number of organisms. In the first case, the commonality of characters would represent a species. In the latter case, the commonality of characters would represent a higher taxa; like genus, family, order or phylum.

Q3. Explain the basis for grouping organisms into five kingdoms.

Answer: Following points explain the basis of grouping organisms into five kingdoms.

Organization of nucleus: Organisms with unorganized nucleus are kept under the kingdom Monera. Those with organized nucleus are kept in other kingdoms.

Number of cells:- Unicellular eukaryotes are kept in the kingdom Protista, while multicellular eukaryotes are kept in other kingdoms.

Mode of nutrition and presence of cell wall: Heterotrophic organisms in which cell wall is present are taken under the kingdom fungi. Autotrophic organisms in which cell wall is present are taken in the kingdom Plantae. Organisms in which cell wall is absent are taken in the kingdom Animalia.

Q4. What are the major divisions in the Plantae? What is the basis for these divisions?

Answer: The major divisions of Plantae and the basis for these divisions are as follows:

- **Thallophyta:** Simple body design; with no differentiation into root, stem and leaves.
- **Bryophyta:** Body is differentiated into stem and leaf-like structures. Vascular system is absent.
- **Pteridophyta:** Body is differentiated into root, stem and leaves. Vascular system is present. Reproductive organs are inconspicuous. Seeds are not produced.
- **Gymnosperms:** Seeds are naked.
- **Angiosperms:** Seeds are covered.

Q5. How are the criteria for deciding divisions in plants different from the criteria for deciding the subgroups among animals?

Answer: In the plant kingdom, morphological characters are taken into consideration while deciding about the divisions. Morphology is the study of shapes and forms of various parts. In the animal kingdom, anatomical characters are taken into consideration while deciding about subgroups. Anatomy is the study of various organs' design in animals.

Q6. Explain how animals in Vertebrata are classified into further subgroups.

Answer: Vertebrates are classified into further subgroups on following bases:

1. **Pisces:** The body is streamlined. Muscular tail is present which assists in locomotion. Body is covered with scales. Paired gills are present; which can breathe oxygen dissolved in water. They are cold-blooded animals. The heart has only two chambers. They lay eggs.
2. **Tetrapoda:** Animals have four limbs for locomotion and hence the name tetrapoda. Tetrapoda is divided into four classes, viz. amphibia, reptilia, aves and mammalia.
 - a. **Amphibia:** These animals are adapted to live both in water and land. Mucus glands on skin keep the skin moist. The animals breathe through skin when in water and through lungs when on land. The heart has three chambers. These are cold blooded animals. Examples: Frog, toad, salamander, etc.
 - b. **Reptilia:** These animals show crawling movement for locomotion. Skin is hardened to form scales. Most of the reptilians have three chambered heart but crocodile has four-chambered heart. They don't need water to lay eggs, rather eggs are covered with hard shells and laid on land. Examples: snakes, lizards, crocodile, turtle, etc.
 - c. **Aves:** The body is covered with feathers. Forelimbs are modified into wings. These are warm-blooded animals. The heart has four chambers. Bones are hollow (pneumatic); which assists in flying. All the birds belong to this class.
 - d. **Mammalia:** The body is covered with hairs. Skin has sweat glands and sebaceous glands. Mammary glands are present in females and are used for nourishing the young ones. Most of the mammals give birth to young ones and are called viviparous. Some of the mammals lay eggs and are called oviparous. Examples: human, chimpanzee, lion, platypus, horse, etc.

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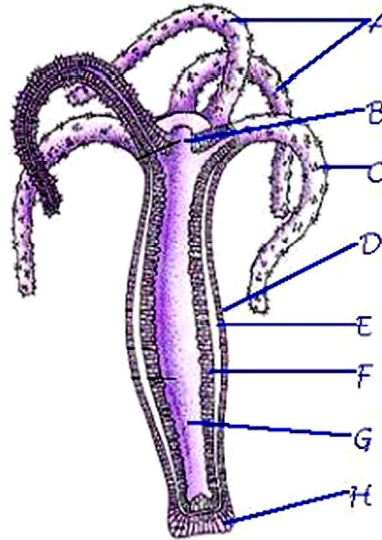
ASSIGNMENT QUESTIONS SET – 1
CHAPTER – 7
DIVERSITY IN ORGANISMS

1. What do you mean by bio diversity?
2. Why do we classify organisms?
3. What are the advantages of classification?
4. Define Taxonomy.
5. Who is known as father of taxonomy?
6. Give three examples of the range of variations that you see in lifeforms around you.
7. What is the primary reason for such a huge diversity we find in animals and plants?
8. Which do you think is a more basic characteristic for classifying organisms? (a) the place where they live. (b) the kind of cells they are made of. Why?
9. What is the primary characteristic on which the first division of organisms is made?
10. Define Taxon.
11. On what bases are plants and animals put into different categories?
12. Who wrote the book The Origin of Species?
13. Which region of the earth is called the region of megadiversity?
14. Name five countries that lie in the region of megadiversity.
15. Define evolution.
16. Based on evolution, primarily how organisms are categorized?
17. Which organisms are called primitive and how are they different from the so-called advanced organisms?
18. Will advanced organisms be the same as complex organisms? Why?
19. Name the book written by Carolus Linnaeus on classification of organisms.
20. In how many kingdoms Carolus Linnaeus dividing living beings?
21. Name the levels of classification proposed by Linnaeus. What happens to similarities among organisms as we go from top to bottom level?
22. In the hierarchy of classification, which grouping will have the smallest number of organisms with a maximum of characteristics in common and which will have the largest number of organisms?
23. Name the scientist who created the third kingdom for all microscopic unicellular organisms. What did he call it?
24. Who identified the Fungi as a separate multicellular eucaryotic kingdom and introduced five kingdoms? Name the five kingdoms.
25. Explain the basis for grouping organisms into five kingdoms.

26. What is the criterion for classification of organisms as belonging to kingdom Monera or Protista?
27. In which kingdom will you place an organism which is singlecelled, eukaryotic and photosynthetic?
28. In which kingdom you will place an organism which is multicellular, eukaryotic, non-green heterotroph or saprophytic, lacks chlorophyll and has absorptive mode of nutrition?
29. In which kingdom, you will place an organism which is multicellular, eukaryotic, heterotroph, lacks chlorophyll and has ingestive mode of nutrition.
30. What is the contribution of Carl Woese (1977) in classification of living beings?
31. Name the organisms which are outside the classification.
32. According to the five-kingdom system, which kingdom contains organisms whose structure is composed of prokaryotic cells?
33. Blue green algae are classified with bacteria and placed in kingdom Monera.
34. What (a) What are saprophytes? (b) Name the kingdom to which they belong. (c) What is the cell wall of fungi made up of?or
35. How do the saprophytes get their food? Give two examples of a saprophyte.
36. What is Symbiotic? Give example of organisms which exhibit this relationship.
37. Classify the following organisms into their respective kingdoms as per Whittaker's five-kingdom system.
38. What are the major divisions in the Plantae? What is the basis for these divisions?
39. Give examples of Thallophyta plants.
40. Why are Thallophytes called non-embryonic plants?
41. Which division among plants has the simplest organisms?
42. What is a thallus?
43. Why bryophytes are called the amphibians of the plant kingdom?
44. List important characteristics (at least three) of bryophytes.
45. Give examples of bryophytes.
46. What are the uses of bryophytes?
47. How are Pteridophytes' bodies organised?
48. How do thallophytes and pteridophytes differ from each other? Write two differences.
49. Name the plants that are called "First vascular land plants".
50. On what basis plants are divided into two sub-kingdoms?
51. How are pteridophytes different from the phanerogams?
52. How Phanerogams are divided further chiefly?
53. What are naked-seeded plants are called?

54. Give two examples of Gymnosperms.
55. Define Cryptograms.
56. How do gymnosperms and angiosperms differ from each other?
57. How Angiosperms are divided further?
58. Write the differences between monocots and dicots.
59. What are the general characteristics found in all animals?
60. In how many Phyla, the animal kingdom is divided into?
61. Name the phylum to which the following are included. (i) Spider (ii) Cockroach (iii) Prawn (iv) Housefly
62. Write two important characteristics of sponges (Phylum: Porifera)
63. What is osculum?
64. Do sponges have nervous system?
65. Give examples of Porifera or Sponges.
66. Identify the phylum having following characteristics: multi-cellular, radially symmetrical, aquatic, hollow gut.
67. What are four main features of phylum coelenterata?
68. 'Animals belong to phylum coelenterata are diploblastic.' What do you mean by the term diploblastic?
69. Which animal phylum is commonly called as flatworms?
70. Which animal phylum is considered to be first triploblastic animals?
71. Write important features about Phylum Plathelminthes.
72. How do poriferan animals differ from coelenterate animals?
73. Which phylum is commonly called roundworms or pinworms?
74. Give examples of animals belong to Nematoda.
75. Name a parasitic disease caused by members of Nematoda.
76. Name the first animals (phylum) that have true body cavity.
77. Leeches and Earthworms belong to which phylum?
78. Differentiate between Annelida and Nematode.
79. Name the largest group (phylum) of animals.
80. Give examples of Arthropod animals.
81. What is the most striking feature of phylum Arthropoda?
82. How is body of Arthropods segmented?
83. What is the type of circulatory system present in Arthropods?
84. How do annelid animals differ from arthropods?
85. Give examples of animals that belong to Phylum Mollusca.

86. What kind of circulatory system is found in animals from Mollusca phylum?
87. How is locomotion brought in animals belonging to Mollusca phylum?
88. Name the phylum to which Star fish and Sea urchin belong to?
89. Name the phylum to which this organism belongs. Write any two characteristic feature of the phylum.
90. Label A to H in the given diagram of hydra.



91. What is a notochord? What does it do?
92. Give examples of organisms which belong to Phylum Protochordata.
93. List three important characteristics of Phylum Protochordata.
94. Why are Bats and whales classified as mammals?
95. A plant specimen was found without differentiated roots.(a) Which plant structure helps in attaching this plant to the substratum?(b) To which group you will keep this plant?(c) Which plant could it be?
96. Why is there a need for classification and systematic naming of living organisms?

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ASSIGNMENT QUESTIONS SET – 2
CHAPTER – 7
DIVERSITY IN ORGANISMS

1. Who introduced the system of scientific nomenclature of organisms?
2. In which Kingdom, an organism does not have a well defined nucleus and organelles?
3. In the hierarchy of classification, which group will have the largest number of organisms?
4. Which in your opinion is more basic characteristic for classifying organism. The place where they live in or the kind of cells they are made of?
5. Give examples of the organisms that have cilia and flagellum for moving around.
6. In the hierarchy of classification, which group will have the smallest number of organisms and a maximum number of similar characteristics?
7. Name the substance which makes the cell wall of fungi.
8. Name a symbiotic life form that grows on the bark of a tree as large, coloured patches.
9. In which kingdom would you place an organism which is unicellular, eukaryotic and photosynthetic?
10. What is the primary characteristic on which the first division of organisms is made?
11. What is the mode of nutrition in Mushroom?
12. Eichler classified the plant kingdom into two sub-kingdoms. Name the two sub kingdoms.
13. Name the kingdom which includes the simplest form of eukaryotes.
14. Do Protozoans have eyes?
15. Name the simplest of plants that do not have a well-differentiated body design.
16. Which division of plants are often called amphibians of the plant kingdom?
17. Woese introduced by dividing the Monera kingdom into two sub-kingdoms. Name the two?
18. Write the name of the group of plants, which produces seeds, but not fruits.
19. Amar, Ujala and Anara wrote the scientific name of mango as follows. Who wrote it correctly. 1) Amar - Mangifera Indica 2) Ujala - Mangifera indica 3) Anara - mangifera indica
20. Algae belongs to which division of Plantae?
21. Name the three divisions of Plantae that have inconspicuous reproductive organs. What are their seeds called?
22. Name the two groups of Plantae that are commonly called phanerogams.
23. Identify the division of Plantae having following characteristics: i).Seeds not enclosed within fruit. ii).Flowers represented as cones (unisexual) iii). Ovules not located in ovary.

24. Identify plant group which has parallel venation, scattered vascular bundles, flower petals/parts in multiple of three, fibrous roots.
25. Identify the plant groups which has net like veins in leaves, flower parts in group of fours or fives, vascular bundles are in a ring and two seed leaves.
26. Give two examples of Bryophyta plants?
27. Give two examples of Pteridophytes
28. Pines and Deodar belong to which group of Plants?
29. Sunflower, Maize, Wheat and Pea belong to which group of plants?
30. Identify which of the following are monocots and dicots: garlic, onion, tomatoes, corn, peppers, potatoes, wheat, beans
31. Minimal body design, have holes which lead to canal system that helps in circulating water, marine habitat. Which division of Animalia it refers to?
32. Hydra, Jelly Fish, corals belong to which group of animals?
33. Commonly called flatworm, bilateral symmetrical, acoelomates are the features of which animal division?
34. Filarial worms, (Ascaris)round worms, (Wuchereria)pin worms belong to which group of animalia?
35. Which is the largest group of animals?
36. Identify the Animalia group having following features: i). jointed legs ii). bilaterally symmetrical segmented body iii). blood filled body cavity (open circulatory system)
37. Which worms cause elephantiasis. Name the group it belongs to?
38. Give three examples of organisms that are arthropods.
39. Give three examples of Molluscs
40. What type of circulatory system do Molluscs have?
41. Spiny skin, marine, triploblastic coelomates having water-driven tube system for locomotion. What type of group are we talking of?
42. Give three examples of animals belong to Echinodermata
43. Give three examples of Protochordata animals.
44. What is the main basis of differentiation between vertebrates and non-vertebrates?
45. Cold blooded, two chamber heart, stream lined body, scales on skin, gills present, aquatic life. Which group of vertebrates are we referring to?
46. Ambibian heart is divided into how many chambers?
47. Name the fish which is entirely made of cartilage.
48. Name the fish having skeleton made of both bone and cartilage.

49. No scales on skin, mucus glands on skin, three chambered heart, respiration through gills, lungs and skin, oviparous, live on land and in water. Name the group of these vertebrates.
50. Give three examples of Amphibians.
51. Snakes, turtles, lizards and crocodiles belong to which category of vertebrates?
52. Name a reptile which has four chambered heart.
53. What changes are evolved in limbs of aves?
54. Give three examples of flightless birds.
55. Four Chambered heart, mostly viviparous, skin covered with hairs, skin contains sweat and oil glands, four chambered heart. Which category of vertebrates are we talking about?
56. Give examples of egg laying mammals
57. Give an example of marsupial mammal
58. Give an example of mammal that can fly.
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ASSIGNMENT QUESTIONS SET – 3
CHAPTER – 7
DIVERSITY IN ORGANISMS

1. Find out incorrect sentence
 - (a) Protista includes unicellular eukaryotic organisms
 - (b) Whittaker considered cell structure, mode and source of nutrition for classifying the organisms in five kingdoms
 - (c) Both Monera and Protista may be autotrophic and heterotrophic
 - (d) Monerans have well defined nucleus
2. Which among the following has specialised tissue for conduction of water?
 - (i) Thallophyta
 - (ii) Bryophyta
 - (iii) Pteridophyta
 - (iv) Gymnosperms
 - (a) (i) and (ii)
 - (b) (ii) and (iii)
 - (c) (iii) and (iv)
 - (d) (i) and (iv)
3. Which among the following produce seeds?

(a) Thallophyta	(b) Bryophyta
(c) Pteridophyta	(d) Gymnosperms
4. Which one is a true fish?

(a) Jellyfish	(b) Starfish
(c) Dogfish	(d) Silverfish
5. Which among the following is exclusively marine?

(a) Porifera	(b) Echinodermata
(c) Mollusca	(d) Pisces
6. Which among the following have open circulatory system?
 - (i) Arthropoda
 - (ii) Mollusca
 - (iii) Annelida
 - (iv) Coelenterata
 - (a) (i) and (ii)
 - (b) (iii) and (iv)
 - (c) (i) and (iii)
 - (d) (ii) and (iv)

7. In which group of animals, coelom is filled with blood?
- (a) Arthropoda
 - (b) Annelida
 - (c) Nematoda
 - (d) Echinodermata
8. Elephantiasis is caused by
- (a) Wuchereria
 - (b) Pinworm
 - (c) Planarians
 - (d) Liver flukes
9. Which one is the most striking or (common) character of the vertebrates?
- (a) Presence of notochord
 - (b) Presence of triploblastic condition
 - (c) Presence of gill pouches
 - (d) Presence of coelom
10. Which among the following have scales?
- (i) Amphibians
 - (ii) Pisces
 - (iii) Reptiles
 - (iv) Mammals
- (a) (i) and (iii)
 - (b) (iii) and (iv)
 - (c) (ii) and (iii)
 - (d) (i) and (ii)
11. Find out the false statement
- (a) Aves are warm blooded, egg laying and have four chambered heart
 - (b) Aves have feather covered body, fore limbs are modified as wing and breathe through lungs
 - (c) Most of the mammals are viviparous
 - (d) Fishes, amphibians and reptiles are oviparous
12. Pteridophyta do not have
- (a) root
 - (b) stem
 - (c) flowers
 - (d) leaves
13. Identify a member of porifera
- (a) *Spongilla*
 - (b) *Euglena*
 - (c) *Penicillium*
 - (d) *Hydra*

- 14.** Which is not an aquatic animal?
- (a) Hydra
 - (b) Jelly fish
 - (c) Corals
 - (d) Filaria
- 15.** Amphibians do not have the following
- (a) Three chambered heart
 - (b) Gills or lungs
 - (c) Scales
 - (d) Mucus glands
- 16.** Organisms without nucleus and cell organelles belong to
- (i) fungi
 - (ii) protista
 - (iii) cyano bacteria
 - (iv) archae bacteria
- (a) (i) and (ii)
 - (b) (iii) and (iv)
 - (c) (i) and (iv)
 - (d) (ii) and (iii)
- 17.** Which of the following is not a criterion for classification of living organisms?
- (a) Body design of the organism
 - (b) Ability to produce one's own food
 - (c) Membrane bound nucleus and cell organelles
 - (d) Height of the plant
- 18.** The feature that is not a characteristic of protochordata?
- (a) Presence of notochord
 - (b) Bilateral symmetry and coelom
 - (c) Jointed legs
 - (d) Presence of circulatory system
- 19.** The locomotory organs of Echinodermata are
- (a) tube feet
 - (b) muscular feet
 - (c) jointed legs
 - (d) parapodia
- 20.** Corals are
- (a) Poriferans attached to some solid support
 - (b) Cnidarians, that are solitary living
 - (c) Poriferans present at the sea bed
 - (d) Cnidarians that live in colonies

21. Who introduced the system of scientific nomenclature of organisms

- (a) Robert Whittaker
- (b) Carolus Linnaeus
- (c) Robert Hooke
- (d) Ernst Haeckel

22. Two chambered heart occurs in

- (a) crocodiles
- (b) fish
- (c) aves
- (d) amphibians

23. Skeleton is made entirely of cartilage in

- (a) Sharks
- (b) Tuna
- (c) Rohu
- (d) None of these

24. One of the following is not an Annelid

- (a) Nereis
- (b) Earthworm
- (c) Leech
- (d) Urchins

25. The book Systema Naturae was written by

- (a) Linnaeus
- (b) Haeckel
- (c) Whittaker
- (d) Robert Brown

26. Karl Von Linne was involved with which branch of science?

- (a) Morphology
- (b) Taxonomy
- (c) Physiology
- (d) Medicine

27. Real organs are absent in

- (a) Mollusca
- (b) Coelenterata
- (c) Arthropoda
- (d) Echinodermata

28. Hard calcium carbonate structures are used as skeleton by

- (a) Echinodermata
- (b) Protochordata
- (c) Arthropoda
- (d) Nematoda

- 29.** Differentiation in segmental fashion occurs in
- (a) Leech
 - (b) Starfish
 - (c) Snails
 - (d) Ascaris
- 30.** In taxonomic hierarchy family comes between
- (a) Class and Order
 - (b) Order and Genus
 - (c) Genus and Species
 - (d) Division and Class
- 31.** The 5-Kingdom classification has given by
- (a) Morgan
 - (b) R. Whittaker
 - (c) Linnaeus
 - (d) Haeckel
- 32.** Well defined nucleus is absent in
- (a) blue green algae
 - (b) diatoms
 - (c) algae
 - (d) yeast
- 33.** The 'Origin of Species' is written by
- (a) Linnaeus
 - (b) Darwin
 - (c) Hackel
 - (d) Whittaker
- 34.** Meena and Hari observed an animal in their garden. Hari called it an insect while Meena said it was an earthworm. Choose the character from the following which confirms that it is an insect.
- (a) Bilateral symmetrical body
 - (b) Body with jointed legs
 - (c) Cylindrical body
 - (d) Body with little segmentation
- 35.** Write true (T) or false (F)
- (a) Whittaker proposed five kingdom classification.
 - (b) Monera is divided into Archaeobacteria and Eubacteria.
 - (c) Starting from Class, Species comes before the Genus.
 - (d) *Anabaena* belongs to the kingdom Monera.
 - (e) Blue green algae belongs to the kingdom Protista.
 - (f) All prokaryotes are classified under Monera.

36. Fill in the blanks

- (a) Fungi shows———mode of nutrition.
- (b) Cell wall of fungi is made up of———.
- (c) Association between blue green algae and fungi is called as———.
- (d) Chemical nature of chitin is———.
- (e)———has smallest number of organisms with maximum number of similar characters
- (f) Plants without well differentiated stem, root and leaf are kept in———.
- (g)———are called as amphibians of the plant kingdom.

37. You are provided with the seeds of gram, wheat, rice, pumpkin, maize and pea. Classify them whether they are monocot or dicot.

38. Match items of column (A) with items of column (B)

(A)	(B)
(a) Naked seed	(A) Angiosperms
(b) Covered seed	(B) Gymnosperms
(c) Flagella	(C) Bryophytes
(d) <i>Marchantia</i>	(D) <i>Euglena</i>
(e) <i>Marsilea</i>	(E) Thallophyta
(f) <i>Cladophora</i>	(F) Pteridophyta
(g) <i>Penicillium</i>	(G) Fungi

39. Match items of column (A) with items of column (B)

(A)	(B)
(a) Pore bearing animals	(A) Arthropoda
(b) Diploblastic	(B) Coelenterata
(c) Metameric segmentation	(C) Porifera
(d) Jointed legs	(D) Echinodermata
(e) Soft bodied animals	(E) Mollusca
(f) Spiny skinned animals	(F) Annelida

40. Classify the following organisms based on the absence/presence of true coelom (i.e., acoelomate, pseudocoelomate and coelomate) *Spongilla*, Sea anemone, Planaria, Liver fluke *Wuchereria*, *Ascaris*, *Nereis*, Earthworm, Scorpion, Birds, Fishes, Horse.

41. Endoskeleton of fishes are made up of cartilage and bone; classify the following fishes as cartilaginous or bony Torpedo, Sting ray, Dog fish, Rohu, Angler fish, Exocoetus.

42. Classify the following based on number of chambers in their heart. Rohu, *Scoliodon*, Frog, Salamander, Flying lizard, King Cobra, Crocodile, Ostrich, Pigeon, Bat, Whale

43. Classify Rohu, *Scoliodon*, Flying lizard, King Cobra, Frog, Salamander, Ostrich, Pigeon, Bat, Crocodile and Whale into the cold blooded/warm blooded animals.

44. Name two egg laying mammals.

45. Fill in the blanks

- (a) Five kingdom classification of living organisms is given by ———.
- (b) Basic smallest unit of classification is ———.
- (c) Prokaryotes are grouped in Kingdom ———.
- (d) *Paramecium* is a protista because of its ———.
- (e) Fungi do not contain ———.
- (f) A fungus ——— can be seen without microscope.
- (g) Common fungi used in preparing the bread is ———.
- (h) Algae and fungi form symbiotic association called ———.

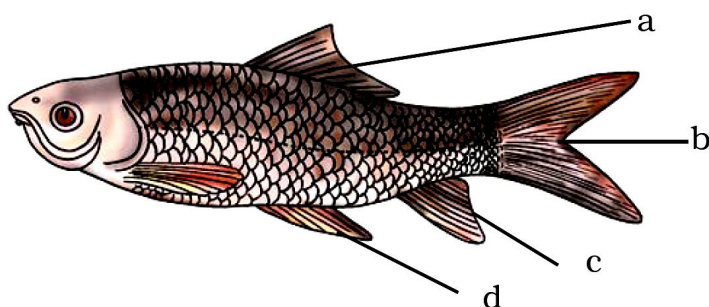
46. Give True (T) and False (F)

- (a) Gymnosperms differ from Angiosperms in having covered seed.
- (b) Non flowering plants are called Cryptogamae.
- (c) Bryophytes have conducting tissue.
- (d) *Funaria* is a moss.
- (e) Compound leaves are found in many ferns.
- (f) Seeds contain embryo.

47. Give examples for the following

- (a) Bilateral, dorsiventral symmetry is found in———.
- (b) Worms causing disease elephantiasis is———.
- (c) Open circulatory system is found in———where coelomic cavity is filled with blood.
- (d) —— are known to have pseudocoelom.

48. Label a, b, c and d. given in below figure. Give the function of (b)



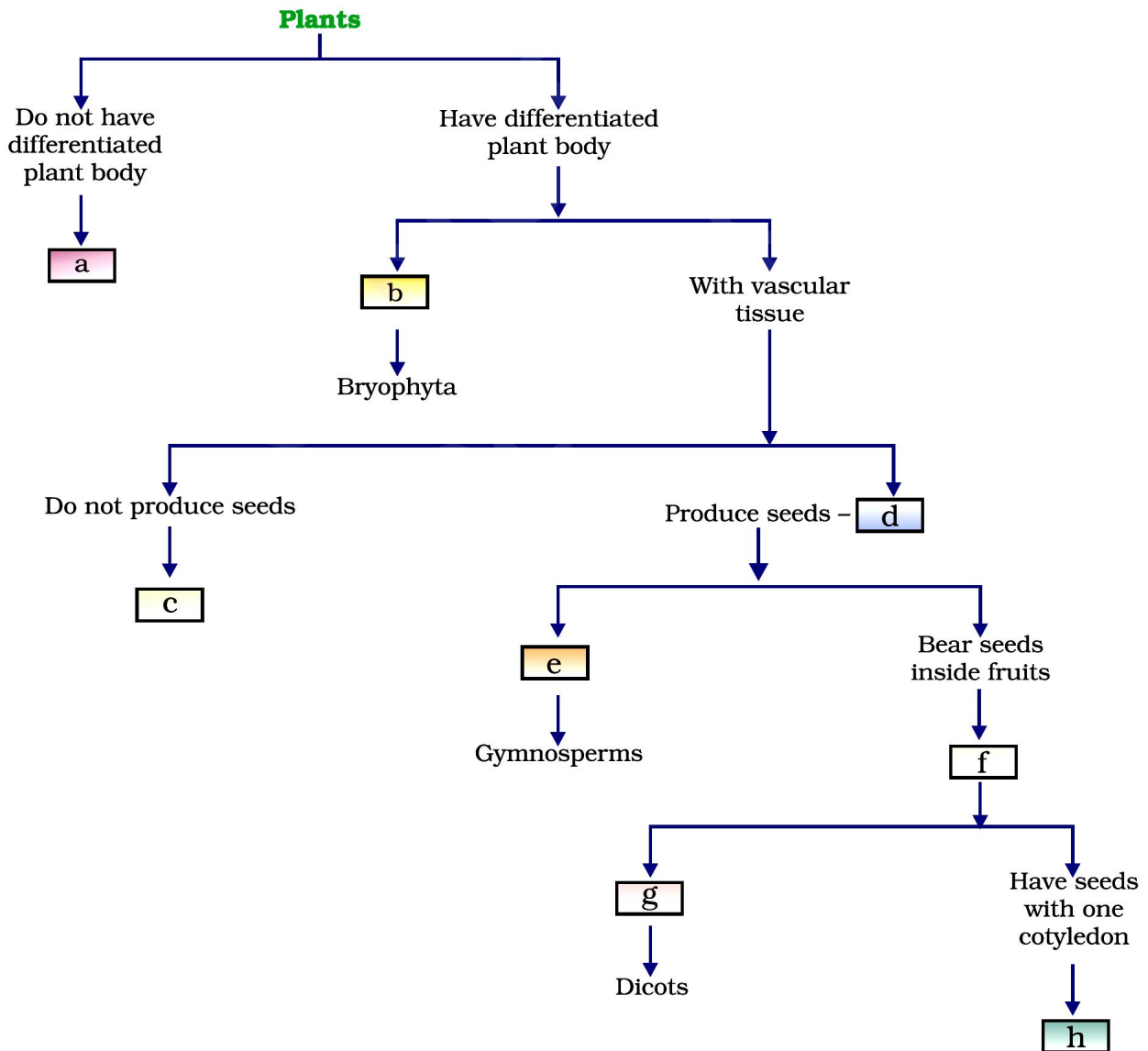
49. Write names of few thallophytes. Draw a labelled diagram of *Spirogyra*.

50. Thallophyta, bryophyta and pteridophyta are called as 'Cryptogams'. Gymnosperms and Angiosperms are called as 'phanerogams'. Discuss why? Draw one example of Gymnosperm.

51. Define the terms and give one example of each (a) Bilateral symmetry (b) Coelom (c) Triploblastic

52. You are given leech, *Nereis*, *Scolopendra*, prawn and scorpion; and all have segmented body organisation. Will you classify them in one group? If no, give the important characters based on which you will separate these organisms into different groups.

53. Fill in the boxes given in below figure with appropriate characteristics/plant group (s)



54. Which organism is more complex and evolved among Bacteria, Mushroom and Mango tree. Give reasons.

55. Differentiate between flying lizard and bird. Draw the diagram.

56. List out some common features in cat, rat and bat.

57. Why do we keep both snake and turtle in the same class?

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CHAPTER – 13

WHY DO WE FALL ILL

HEALTH AND ITS FAILURE

Good health is a very hard thing to measure, but it is one of life's most precious things. The World Health Organisation has defined health as a state of complete physical, mental and social well-being.

Community health can be defined as "All the personal health along with the environmental services for the importance of health of community".

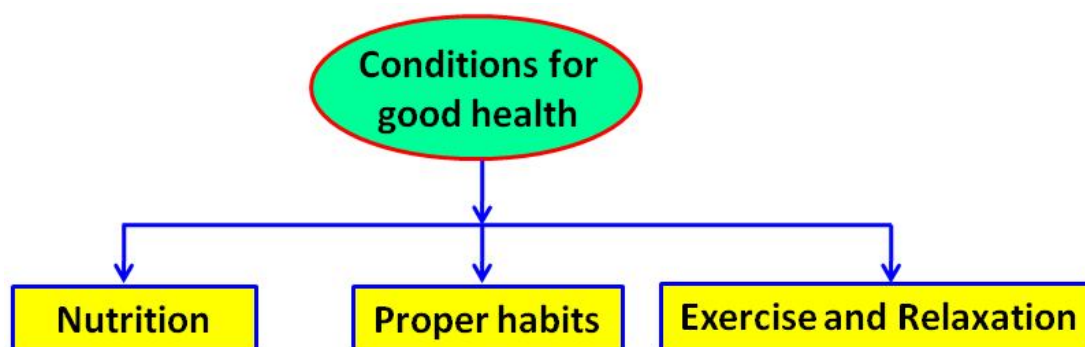
Some of the health services are given below:

- (i) Establishment of health care services like primary health centers, district hospitals, community health centers, medical colleges, all Indian institutes, regional hospitals etc.
- (ii) Provision of safe drinking water and proper disposal of garbage.
- (iii) Prevention of harmful insect breeding sites.
- (iv) Management of different types of environmental pollution by Central and State Pollution Control Boards.
- (v) Preventive vaccinations against number of diseases like tuberculosis, diphtheria, whooping cough, tetanus, measles, hepatitis, etc.
- (vi) Provision of family planning advices and services.
- (vii) Provision of medical care to school going children.
- (viii) Prevention of food adulteration.
- (ix) Health education.

CONDITIONS ESSENTIAL FOR GOOD HEALTH

There are several conditions which have to be fulfilled for good health. The important ones are

- (i) Nutrition,
- (ii) Proper habits, and
- (iii) Exercise and relaxation.



(i) Nutrition

Nutrition can be defined as the procurement of substances necessary for growth, development, maintenance and activities of a living organism.

We obtain food from various plant and animal sources. In order to keep healthy and energetic, we need to take food. It takes care of the daily energy need also. We consume energy even while sleeping. Energy requirement depends on individual, age and special need. Growing children, pregnant women and nursing mothers need more energy.

(ii) Proper Habits

Another important aspect of good health is to observe proper dietary habits that are consumption of balanced diet and at fixed time. Good personal and domestic hygiene is very essential. Take full care of the following aspects.

- Your food should be fresh and kept away from dust, flies, insect and microbes to avoid any infection and spoilage.
- Utensils should be kept clean.
- You should wash your face and hands with soap before eating or handling the food.
- Food should be cooked with good feelings and cheerful state.
- Smoking, chewing tobacco, drinking alcohol, taking addictive drugs are bad habits and should be avoided.
- They can have damaging effects on our body and mind.

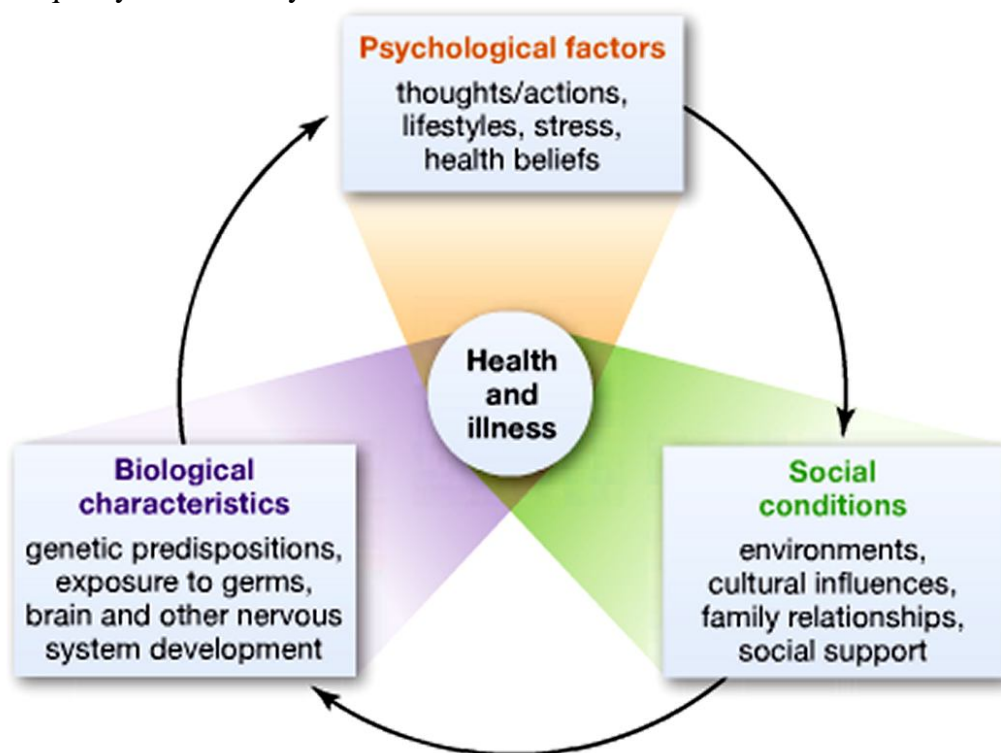
(iii) Exercise and Relaxation

Regular exercise is necessary to keep our body fit. These exercises vary with age, physical condition and nature of work of the individual. In the case of sedentary worker, exercise is even more essential. Another aspect of health is regular sleep and relaxation. The duration of sleep also varies with age and nature of work. Infants sleep for long hours, which is necessary for them to grow. For children, an average of eight hours of sound sleep is sufficient. For adults six hours of sleep is enough. Relaxation improves the capacity to work. Relaxation may be defined as an activity or recreation, which provides a relief or diversion from work or effort. There are various ways of relaxation. Yoga and meditation relax the body and mind. Listening to music and reading magazines are also relaxing.

PERSONAL AND COMMUNITY ISSUES BOTH MATTER FOR HEALTH

Health is a state of physical, mental and social well being. The conditions necessary for good health are :-

- i) Good physical and social environment.
- ii) Good economic conditions.
- iii) Social equality and harmony.



- Good physical and social environment includes clean surroundings, good sanitation, proper garbage disposal and clean drinking water.
- Good economic conditions includes job opportunities for all for earning to have nutritious food and to lead a healthy life.
- Social equality and harmony are necessary for a healthy and peaceful life.

DISTINCTIONS BETWEEN 'HEALTHY' AND 'DISEASE-FREE'

Healthy	Disease free
It is a state of physical, mental and social well being.	It is a state of absence from diseases.
It refers to the individual, physical and social environment.	It refers only to the individual.
The individual has good health.	The individual may have good health or poor health.

DISEASE AND ITS CAUSES

A person may be regarded as suffering from a disease when his body does not function properly. Minor and major disorders of the body may lead to diseases. Infectious diseases are caused by germs. One of the greatest achievements in the history of mankind is the demonstration by Pasteur, Koch and others of germs or microbes that cause diseases. Microbes are the microscopic organisms such as virus, bacteria, some fungi and protozoans that are responsible for causing diseases in human beings. Cholera, tetanus, typhoid, diphtheria and pneumonia are some common diseases caused by bacteria. Polio, common cold, influenza, measles, chicken pox and AIDS are diseases caused by virus. Amoebic dysentery and malaria are caused by protozoans.

Name of the disease	Medium
Tuberculosis, pneumonia, diphtheria, influenza, measles and common cold	Air
Cholera, typhoid, dysentery and diarrhoea	Food, water
Leprosy, ringworm and scabies	Skin contact
Malaria, filarial and plaque	Insects

ACUTE AND CHRONIC DISEASES

When a person is affected by a disease either the normal functioning or the appearance of one or more systems of the body changes for the worse. These changes give rise to signs of the disease called symptoms. On the basis of the symptoms the physicians look for the signs of a particular disease and conduct tests to confirm the disease.

Types of diseases :- Diseases are of different types. They are :- i) Acute diseases :- are diseases which last only for a short period of time and does not have long term effect on health. Eg:- cold, cough, typhoid, cholera etc. ii) Chronic disease :- are diseases which lasts for a long time and has long term drastic effect on health. Eg :- diabetes, tuberculosis, elephantiasis, arthritis, cancer etc.

Difference between Acute Disease and Chronic Disease

Acute Disease	Chronic Disease
They are short duration disease.	They are long lasting disease.
Patient recovers completely after the cure.	Patient does not recover completely.
There is no loss of weight or feeling of tiredness afterward.	There is often loss of weight or feeling of tiredness.
There is short duration loss of work and efficiency.	There is a prolonged loss of work and efficiency.

CHRONIC DISEASES AND POOR HEALTH

Chronic disease is a disease that persists for a long time. Chronic diseases are the major cause of death and disability worldwide.

The total number of people dying from chronic diseases is double that of all infectious diseases (including HIV/AIDS, tuberculosis and malaria), maternal and parental conditions, and nutritional deficiencies combined. 80% of chronic disease deaths occur in low and middle income countries and half are in women. Without action to address the causes, deaths from chronic disease will increase by 17% between 2005 and 2015.

Chronic diseases

- Cardiovascular diseases, mainly heart disease and
- Stroke;
- Cancer;
- others, such as mental disorders, vision and hearing
- impairment, oral diseases, bone and joint disorders,
- chronic respiratory diseases;
- diabetes;
- genetic disorders.

HEART DISEASE

There are many forms of heart disease. Coronary heart disease, also known as coronary artery disease or ischaemic heart disease, is the leading cause of death globally. It is caused by disease of the blood vessels (atherosclerosis) of the heart.

STROKE

Stroke is a disease of the brain caused by interference to the blood supply. Stroke and heart disease are the main cardiovascular diseases.

CANCER

Cancer describes a range of diseases in which abnormal cells proliferate and spread out of control. Other terms used are tumours and neoplasms. There are many types of cancer and all organs of the body can become cancerous.

CHRONIC RESPIRATORY DISEASES

Diseases of the lung take many forms. Chronic obstructive respiratory disease and asthma are the most common forms.

Chronic obstructive respiratory disease is caused by irreversible obstruction of the larger airways in the lung; asthma is caused by reversible obstruction of the smaller airways in the lung.

DIABETES

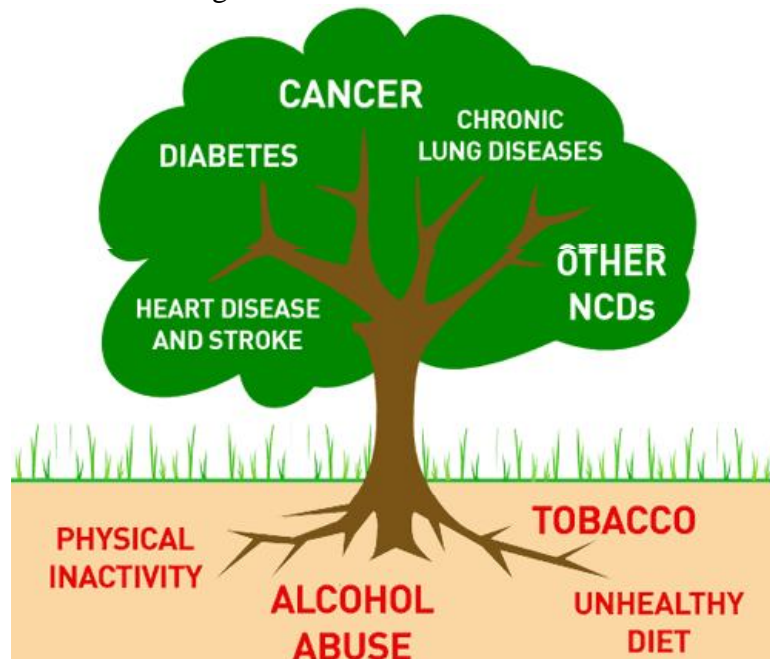
Diabetes is characterized by raised blood glucose (sugar) levels. This results from a lack of the hormone insulin, which controls blood glucose levels, and/or an inability of the body's tissues to respond properly to insulin. The most common type of diabetes is type 2, which accounts for about 90% of all diabetes and is largely the result of excessive weight and physical inactivity. The usual childhood form of diabetes (type 1 diabetes) is caused by an absolute lack of insulin. Without insulin, type 1 diabetes is rapidly fatal.

WHAT CAUSES CHRONIC DISEASES?

The causes (risk factors) of chronic diseases are well established and well known; a small set of common risk factors are responsible for most of the main chronic diseases. These risk factors are modifiable and the same in men and women:

- unhealthy diet;
- physical inactivity;
- tobacco use.

These causes are expressed through the intermediate risk factors of raised blood pressure, raised glucose levels, abnormal blood lipids, overweight and obesity. The major modifiable risk factors, in conjunction with the non-modifiable risk factors of age and heredity, explain the majority of new events of heart disease, stroke, chronic respiratory diseases and some important cancers. The relationship between the major modifiable risk factors and the main chronic diseases is similar in all regions of the world.



OTHER RISK FACTORS

Many more risk factors for chronic diseases have been identified, but they account for a smaller proportion of disease. Harmful alcohol use is an important contributor to the global burden of disease but its relationship to chronic disease is more complex. Other risk factors for chronic disease include infectious agents that are responsible for cervical and liver cancers, and some environmental factors, such as air pollution, which contribute to a range of chronic diseases including asthma and other chronic respiratory diseases.

PSYCHOSOCIAL AND GENETIC FACTORS ALSO PLAY A ROLE.

➤ **Childhood risk**

There is now extensive evidence from many countries that conditions before birth and in early childhood influence health in adult life. For example, low birth weight is now known to be associated with increased rates of high blood pressure, heart disease, stroke and diabetes.

➤ **Risk accumulation**

Ageing is an important marker of the accumulation of modifiable risks for chronic disease: the impact of risk factors increases over the life course.

➤ **Underlying determinants**

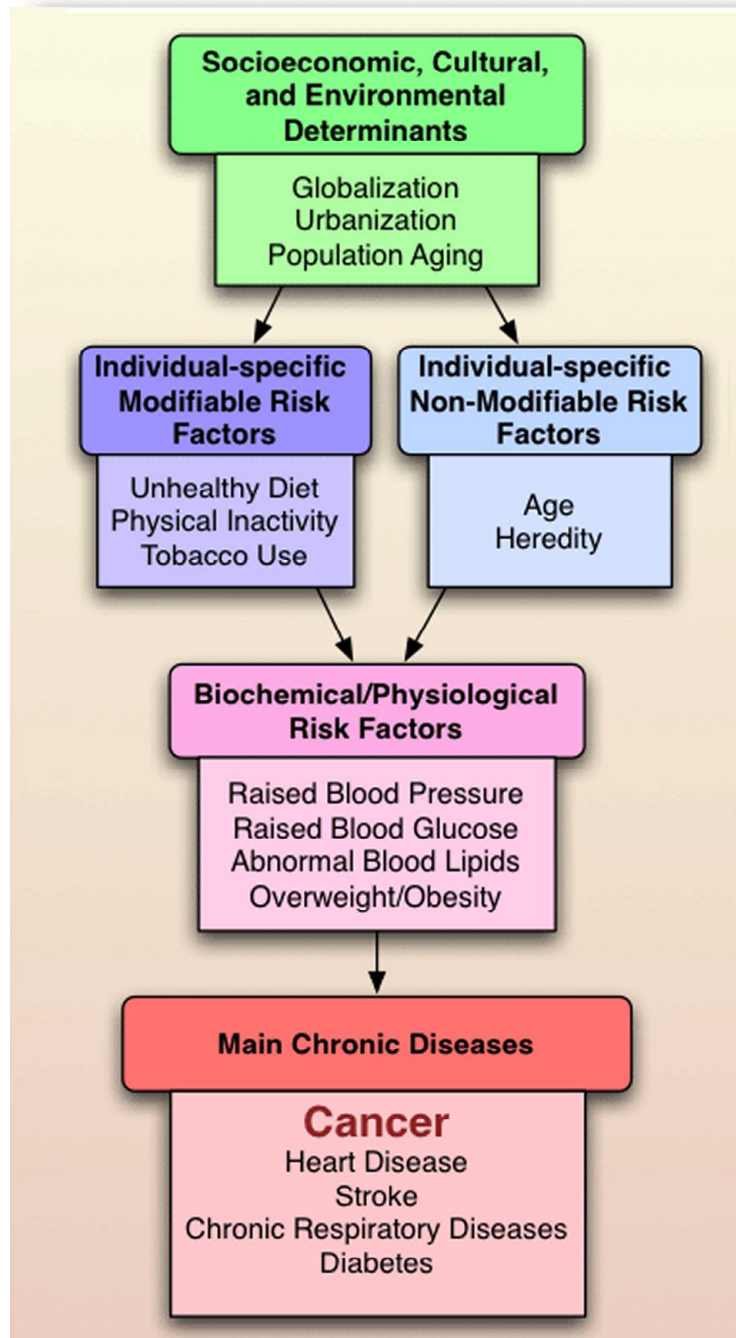
The underlying determinants of chronic diseases are a reflection of the major forces driving social, economic and cultural change – globalization, urbanization, population ageing, and the general policy environment.

➤ **Poverty**

Chronic diseases and poverty are interconnected in a vicious circle. At the same time, poverty and worsening of already existing poverty are caused by chronic diseases. The poor are more vulnerable for several reasons, including greater exposure to risks and decreased access to health services.

➤ **Psychosocial stress also plays a role.**

Causes of Chronic Diseases



INFECTIOUS AND NON-INFECTIOUS CAUSES

Infectious diseases (Communicable diseases) :- are diseases which spread from an infected person to a healthy person through air, water, food, vectors, physical contact or sexual contact. Eg :- common cold, chicken pox, mumps, measles, typhoid, cholera, tuberculosis, malaria, AIDS etc.

Non-infectious diseases (Non-communicable diseases) :- are diseases which are not spread from an infected person to a healthy person. Eg :- beri beri, rickets, scurvy, night blindness, diabetes, cancer, high blood pressure etc. 5) Causes of diseases :- Diseases are caused by :- i) Pathogens like virus, bacteria, fungi, protozoans or worms. ii) Poor health and under

nourishment. iii) Malfunctioning of body parts. iv) Environmental pollution. v) Genetic disorders.

INFECTIOUS AGENTS

Infectious diseases are caused by microorganisms such as viruses, bacteria, fungi or parasites and can spread between individuals.

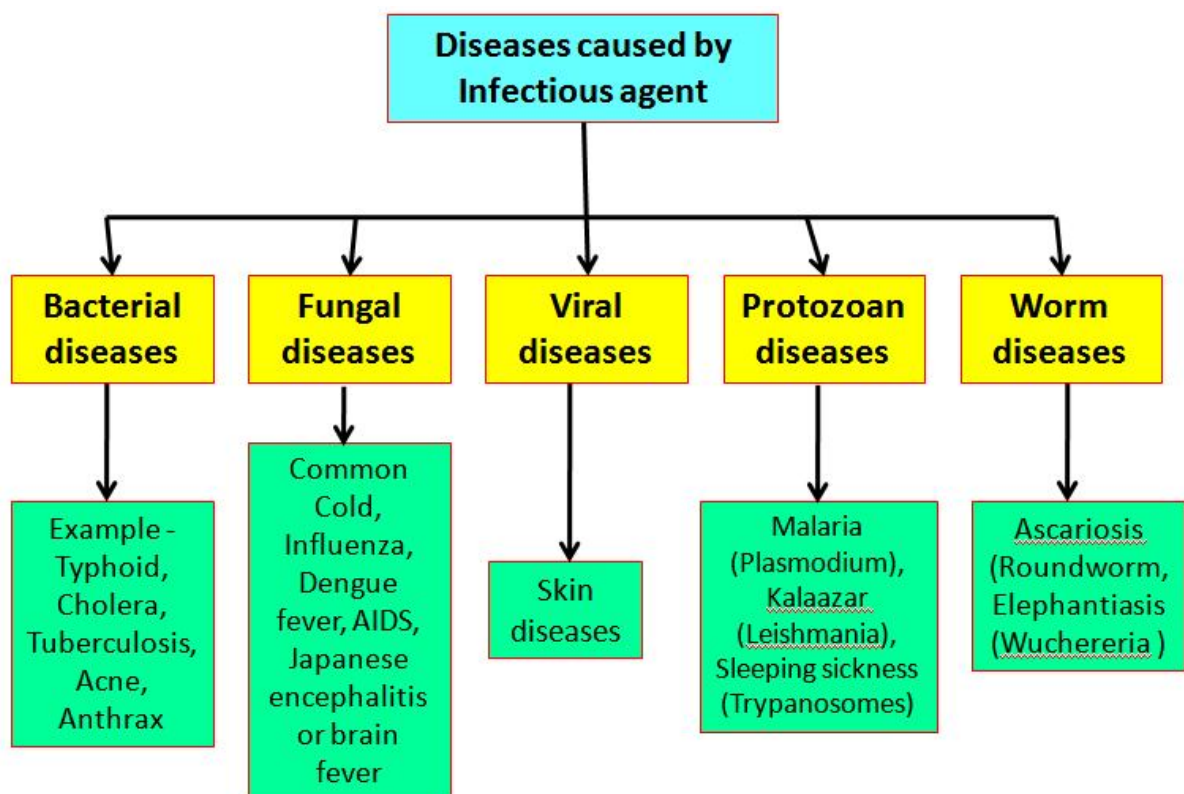
Microorganisms that cause disease are collectively called pathogens.

Pathogens cause disease either by disrupting the bodies normal processes and/or stimulating the immune system to produce a defensive response, resulting in high fever, inflammation and other symptoms.

Infectious diseases can be spread from one person to another, for example through contact with bodily fluids, by aerosols (through coughing and sneezing), or via a vector, for example a mosquito.

Infectious diseases can be caused by:

- **Bacteria.** These one-cell organisms are responsible for illnesses such as strep throat, urinary tract infections and tuberculosis.
- **Viruses.** Even smaller than bacteria, viruses cause a multitude of diseases — ranging from the common cold to AIDS.
- **Fungi.** Many skin diseases, such as ringworm and athlete's foot, are caused by fungi. Other types of fungi can infect your lungs or nervous system.
- **Parasites.** Malaria is caused by a tiny parasite that is transmitted by a mosquito bite. Other parasites may be transmitted to humans from animal feces.

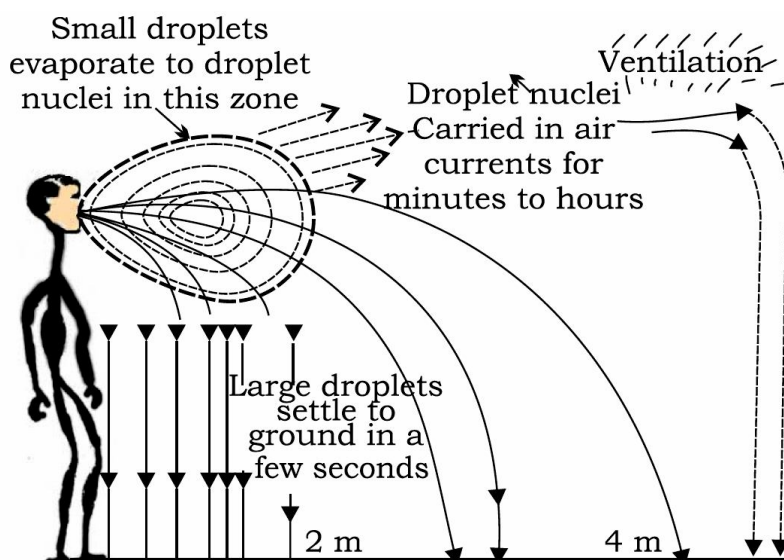


MEANS OF SPREAD

Infectious diseases spread from an infected person to a healthy person through air, water, food, vectors, physical contact and sexual contact.

- i) Through air :- Common cold, Tuberculosis, Pneumonia etc.
- ii) Through water :- Cholera, Amoebic dysentery etc.
- iii) Through vectors :- Mosquitoes :- Malaria, Dengue, Yellow fever etc. Flies :- Typhoid, Tuberculosis, Diarrhoea, Dysentery etc.
- iv) Through sexual contact :- Syphilis, AIDS. AIDS virus can also spread through blood transfusion and from the mother to her child during pregnancy and through breast feeding.

The below figure shows how Air-transmitted diseases are easier to catch the closer we are to the infected person. However, in closed areas, the droplet nuclei recirculate and pose a risk to everybody. Overcrowded and poorly ventilated housing is therefore a major factor in the spread of airborne diseases.



Disease can also be spread through water. This occurs if the excreta from someone suffering from an infectious gut gets mixed with water. Eg cholera, gets mixed with the drinking water used by people living near by. The cholera causing microbes will enter new hosts through the water they drink and cause disease in them. Such diseases are much more likely to spread in the absence of safe supplies of drinking water.

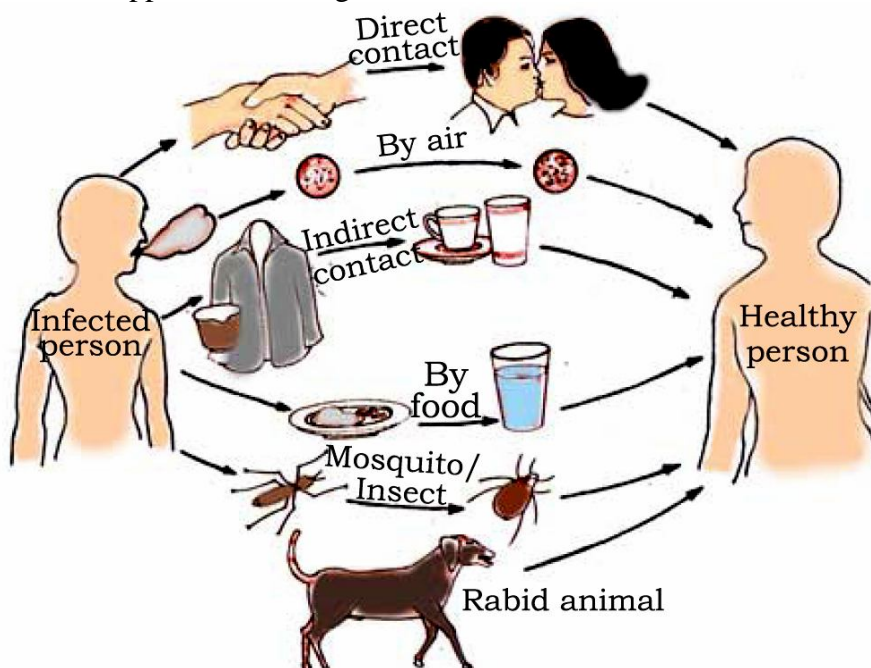


Fig. Common methods of transmission of diseases.

The sexual act is one of the closest physical contacts two people can have with each other. Not surprisingly, there are microbial diseases such as syphilis or AIDS that are transmitted by sexual contact from one partner to the other. However, such sexually transmitted diseases are not spread by casual physical contact. Casual physical contacts include handshakes or hugs or sports, like wrestling, or by any of the other ways in which we touch each other socially. Other than the sexual contact, the AIDS virus can also spread through blood to blood contact with infected people or from an infected mother to her baby during pregnancy or through breast feeding.

ORGAN-SPECIFIC AND TISSUESPECIFIC MANIFESTATIONS

Disease causing microbes enter the body by different means and goes to different organs and tissues.

- Microbes which enters through the nose are likely to go to the lungs. (Bacteria which cause tuberculosis of lungs).
- Microbes which enter through the mouth are likely to stay in the gut (Bacteria which causes Typhoid) or liver (Bacteria which causes Jaundice).
- Virus which causes AIDS enter the body through sexual organs during sexual contact and spreads through the lymph to all parts of the body and damages the immune system.
- Malaria-causing microbes, entering through a mosquito bite, will go to the liver, and then to the red blood cells.
- The virus causing Japanese encephalitis, or brain fever, will similarly enter through a mosquito bite goes and infects the brain.

PRINCIPLES OF TREATMENT

The treatment of infectious diseases consists of two steps. They are to reduce the effects of the disease (symptoms) and to kill the microbes which caused the disease.

i) To reduce the effects of the disease :- This can be done by taking medicines to bring down the effects of the disease like fever, pain or loose motions etc. and by taking bed rest to conserve our energy.

ii) To kill the microbes :- This can be done by taking suitable antibiotics and drugs which kills the microbes and the disease is cured.

PRINCIPLES OF PREVENTION

There are two ways of prevention of infectious diseases. They are general ways and specific ways.

i) General ways of prevention :- Public hygiene is most important for prevention of infectious diseases. Proper and sufficient food for every one will make people healthy to resist infection. Air borne diseases can be prevented by living in conditions that are not crowded. Water borne diseases can be prevented by providing safe drinking water. Vector borne diseases can be prevented by providing clean environment.

ii) Specific ways of prevention :- The specific ways to prevent infectious disease is immunisation by taking vaccines. Vaccines provide immunity from infectious diseases like tetanus, diphtheria, whooping cough, measles, polio etc. Our body has an immune system which fights microbial infection. When this system first sees an infectious microbe, it kills the microbe and remembers it. So if the microbe enters the body the next time, it responds more vigorously. Vaccines mimic the infectious microbe and strengthens our immune system and protects the body from infectious diseases.

IMMUNISATION

Immunisation gives a very good level of protection against many serious diseases.

It uses your body's natural defence mechanism, the immune response, to build resistance to specific infection.

There are three reasons why we immunise children.

- **First**, immunisation prevents children from becoming ill with unpleasant and serious infectious diseases, which have a risk of complications and long-term side effects.
- **Second**, we immunise to try and help protect all children in the population. The more people who are immunised, the less of the infectious disease there is around so the less chance there is of anyone catching it. When levels of immunisation against an infectious disease are really, really high - then something happens called 'herd immunity' where the risk of the disease occurring is so low that even those who cannot be immunised are unlikely to be affected.
- **Third**, we immunise to try and wipe out as many infectious diseases as we can everywhere in the world.

National Immunization Schedule		
For Infants	Vaccine & Dose	Route
At Birth	BCG 0.1ml + OPV 2drops(0 dose)	Intradermal
6 weeks	BCG 0.1ml [if not at birth]	Intradermal
10 weeks	DPT-1 0.5ml + OPV-1 2drops	I/M + Oral
14 weeks	DPT-2 + OPV-2	I/M + Oral
9-12 months	DPT-3 + OPV-3	I/M + Oral
	Measles 0.5ml + Vit. A 2ml	Deep S/C + Oral
At 18 months	DPT + OPV[Boosters-1]	I/M + Oral
At 24, 30, 36 months	Vitamin A 2ml	Oral
At 5-6 years	DT[Booster-2]	I/M
At 10 and 16 years	Tetanus Toxoid	I/M
For Pregnant Women	Vaccine & Dose	Route
Early in Pregnancy	TT-1 or Booster	I/M
One month after TT-1	TT-2	I/M

SUPPLEMENTARY NOTES

CAUSES OF INFECTIOUS DISEASES (INFECTIOUS AGENTS)

VIRUSES

Viral diseases are extremely widespread infections caused by viruses, a type of microorganism. There are many types of viruses that cause a wide variety of viral diseases. The most common type of viral disease is the common cold, which is caused by a viral infection of the upper respiratory tract (nose and throat). Other common viral diseases include:

- Chickenpox
- Flu (influenza)

- Herpes
- Human immunodeficiency virus (HIV/AIDS)
- Human papillomavirus (HPV)
- Infectious mononucleosis
- Mumps, measles and rubella
- Shingles
- Viral gastroenteritis (stomach flu)
- Viral hepatitis
- Viral meningitis
- Viral pneumonia

Viral diseases are contagious and spread from person to person when a virus enters the body and begins to multiply. Common ways that viruses spread from person to person include:

- Breathing in air-borne droplets contaminated with a virus
- Eating food or drinking water contaminated with a virus
- Having sexual contact with a person who is infected with a sexually transmitted virus
- Indirect transmission from person to person by a virus host, such as a mosquito, tick, or field mouse
- Touching surfaces or body fluids contaminated with a virus

Viral diseases result in a wide variety of symptoms that vary in character and severity depending on the type of viral infection and other factors, including the person's age and overall health. Common symptoms of viral diseases include flu-like symptoms and malaise.

Viral diseases are not treatable with antibiotics, which can only cure bacterial diseases and infections. However, the most common viral diseases, the common cold and the flu, are self-limiting in generally healthy people. This means that the viral infection causes illness for a period of time, then it resolves and symptoms disappear as your immune system attacks the virus and your body recovers.

In some cases, viral diseases can lead to serious, possibly life-threatening complications, such as dehydration, bacterial pneumonia, and other secondary bacterial infections. People at risk for complications include those who have a chronic disease or a suppressed or compromised immune system, and the very young and very old. In addition, certain types of sexually transmitted viral infections, such as HIV/AIDS and HPV, can lead to serious complications and death. Seek prompt medical care if you think you have a viral disease, especially if you are at risk for complications, or if you believe you have been exposed to a sexually transmitted disease.

Seek immediate medical care if you, or someone you are with, have serious symptoms of an illness or a viral disease, such as shortness of breath, chest pain, passing out (fainting), or a change in alertness or consciousness.

SYMPTOMS OF VIRAL DISEASES

Symptoms of viral diseases vary depending on the specific type of virus causing infection, the area of the body that is infected, the age and health history of the patient, and other factors. The symptoms of viral diseases can affect almost any area of the body or body system. Symptoms of viral diseases can include:

- Flu-like symptoms (fatigue, fever, sore throat, headache, cough, aches and pains)
- Gastrointestinal disturbances, such as diarrhea, nausea and vomiting
- Irritability
- Malaise (general ill feeling)
- Rash
- Sneezing
- Stuffy nose, nasal congestion, runny nose, or postnasal drip

- Swollen lymph nodes
- Swollen tonsils
- Unexplained weight loss

In infants, signs of a viral disease can also include:

- Bulging of the soft spot on the top of the head
- Difficulty with feeding
- Excessive crying or fussiness
- Excessive sleepiness

Serious symptoms that might indicate a life-threatening condition

In some cases, viral diseases can result in serious complications, such as dehydration or pneumonia. Seek immediate medical care (call 911) if you, or someone you are with, have any of the following symptoms:

- Change in alertness or level of consciousness
- Chest pain
- Deep, wet chest cough that produces yellow, green or brownish phlegm
- High fever (higher than 101 degrees Fahrenheit)
- Lethargy or unresponsiveness
- Seizure
- Shortness of breath, wheezing, or difficulty breathing
- Stiff neck
- Yellowing of the skin and whites of the eyes (jaundice)

WHAT CAUSES VIRAL DISEASES?

Viral infections occur when a virus enters the body and invades the inside of the body's cells in order to reproduce. If the body's immune system is unable to fight off the virus, it multiplies and spreads to other cells, repeating the process and leading to a widespread infection.

Types of viruses

There are many types of viruses that cause a wide variety of viral infections or viral diseases. In fact, there are more than 200 different viruses that can cause a cold or an upper respiratory infection. Other common viruses include the following:

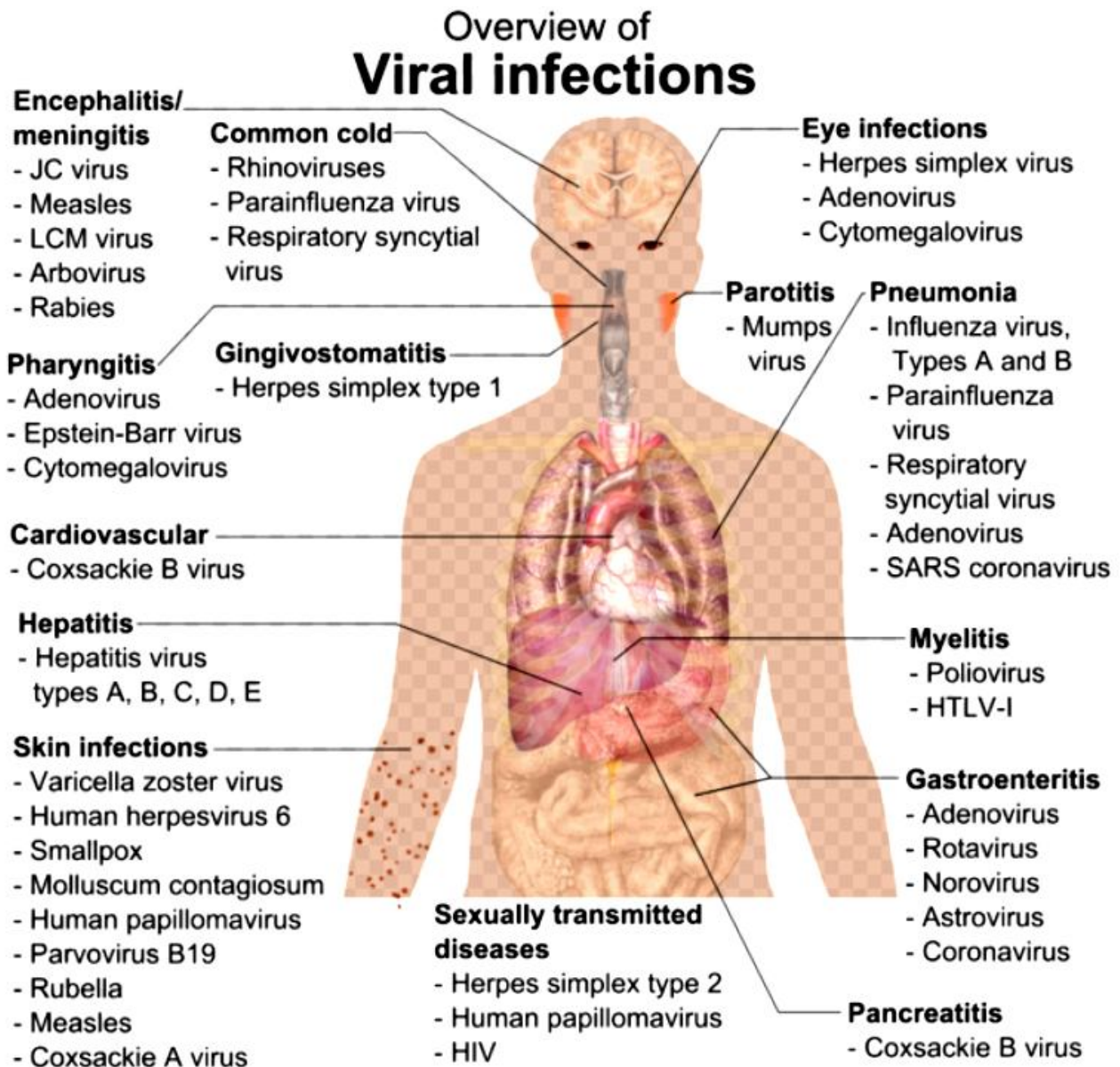
- Epstein-Barr virus causes infectious mononucleosis (cytomegalovirus causes a very similar disease in some people).
- Human immunodeficiency virus (HIV) causes AIDS.
- Human papillomaviruses (HPV) cause HPV infection, cervical dysplasia, genital warts, and cervical cancer.
- Influenza viruses, such as H1N1, cause influenza (flu).
- Respiratory syncytial virus (RSV) causes lower respiratory tract infections in young children.
- Rhinoviruses cause the common cold.
- Rotavirus, enteroviruses and noroviruses cause viral gastroenteritis.
- Varicella zoster virus causes shingles and chickenpox.
- West Nile virus causes West Nile fever.

Various ways to become infected with a virus

Our body infected with a virus in a variety of ways including:

- Being bitten by an animal infected with a virus
- Being bitten by an insect infected with a virus, such as with West Nile virus
- Breathing in air-borne droplets contaminated with a virus
- Eating food or drinking water contaminated with a virus
- Having sexual contact with a person who is infected with a sexually transmitted virus

- Sharing needles for tattooing or drug use with an infected person
- Touching infected feces or body fluids and not washing your hands before eating or touching your mouth, eyes or nose
- Touching surfaces contaminated with a virus
- Transmission of a virus from an infected mother to her baby during pregnancy or delivery



What are the risk factors for contracting viral diseases?

Viral diseases can occur in any age group or population. Everybody contracts viral diseases during their life, although in some cases, the virus does not cause obvious symptoms. Risk factors for catching a viral disease or developing complications of a viral disease include:

- Advanced age
- Compromised immune system due to an immunodeficiency disorder, HIV/AIDS, cancer or cancer treatment, kidney disease, or other condition
- History of chronic disease, such as asthma, COPD, diabetes, tuberculosis, or heart disease
- Malnourishment
- Not getting enough rest and having high levels of stress

- Not washing your hands frequently, especially before eating or after using the restroom, or after touching common surfaces
- Sharing needles to inject drugs or for tattooing
- Unprotected sex including vaginal, oral and anal sex with a partner who has had one or more other sexual partners
- Young age including infancy and elementary-school-age children

Reducing your risk of viral diseases

We can lower your risk of catching or spreading a viral disease by:

- Abstaining from sexual activity, or only engaging in sexual activities within a mutually monogamous relationship in which neither partner is infected with a sexually transmitted disease
- Avoiding contact of your hands with your eyes, nose and mouth, which can transmit a virus into the body
- Avoiding contact with a person who has a viral disease
- Covering your mouth and nose with your elbow (not your hand) or a tissue when sneezing or coughing
- Eating a well-balanced diet that includes sufficient amounts of fruits and vegetables
- Sufficient rest
- Using a new condom for each sex act
- Using a sterile, unused needle for each act of tattooing or injectable drug use
- Using appropriate antibacterial cleaners to clean your hands and surfaces
- Vaccination as recommended by your health care provider for viral diseases, such as chickenpox, shingles, influenza, HPV, hepatitis B, hepatitis A, measles, and mumps
- Washing your hands with soap and water for at least 15 seconds after contact with a person who has a viral disease, before eating, or after using the restroom or touching feces, body fluids, surfaces, or foods that are potentially contaminated with viruses

How are viral diseases treated?

Treatment of viral infections varies depending on the specific virus and other factors. General treatment measures are aimed at relieving your symptoms so that you can get the rest you need to keep up your strength and recover without developing complications.

General treatments for viral infections include:

- Acetaminophen (Tylenol) or ibuprofen (Motrin, Advil) for fever, body aches, and pain
- Drinking extra fluids
- Getting extra rest and sleep
- Maintaining good nutrition

Depending on the type of viral infection and the presence of complications, a wide variety of other treatments may be needed. For example, a human papillomavirus (HPV) infection that leads to cervical dysplasia can be treated by surgical removal of the abnormal cells on a woman's cervix.

In general, it is recommended that children younger than age six not use cold or cough medications because of the risk for serious side effects. In addition, people with a viral disease should not use aspirin or products that contain aspirin because of the risk of developing a rare but life-threatening condition called Reye syndrome. Reye syndrome has been linked to taking aspirin during a viral illness, such as a cold or the flu.

Prescription medications used to treat viral diseases

In some cases, certain medications may be prescribed to treat viral diseases:

- Antiretroviral medications, which can help people with HIV/AIDS lead longer lives. Antiretroviral medications hinder the ability of HIV to reproduce, which slows the spread of HIV in the body.

- Antiviral drugs, which minimize the severity and length of some viral infections, such as the flu and shingles, especially in people who are at a high risk for serious complications. For example, the drugs oseltamivir (brand name Tamiflu) and zanamivir (brand name Relenza) may be prescribed for some cases of flu. These drugs are not appropriate for all people with the flu.

Antibiotics, which are not prescribed for viral diseases because they are ineffective in the treatment of viral infections, may be prescribed if a person with a viral disease develops a secondary bacterial infection, such as bacterial pneumonia, bacterial bronchitis, or encephalitis.

Complementary treatments

Complementary and traditional treatments will not cure a viral disease but may help to increase comfort, promote rest, and minimize symptoms of viral diseases. Some possible treatments include:

- Chicken soup to help break up congestion and provide easy-to-digest nutrients and extra fluids to help keep up strength
- Supplements or products that contain vitamin C, echinacea, or zinc
- Using a vaporizer
- Using mentholated ointments on the chest

What are the possible complications of viral diseases?

In some people, viral diseases can break down the body's defenses and lead to more serious infections and life-threatening complications. Therefore, it is important to visit your health care provider when you have symptoms of a viral infection. Once the underlying infection has been determined, following the treatment plan outlined by your health care provider can help reduce any potential complications including:

- Acute bronchitis
- Cervical cancer (from human papillomavirus infection)
- Dehydration
- Frequent life-threatening, opportunistic infections
- Otitis media (ear infection)
- Pneumonia
- Secondary bacterial infection
- Seizures
- Shock and coma
- Sinusitis
- Worsening of asthma

BACTERIA

Bacteria are single-celled microorganisms.

They come in many shapes including ball-, rod- and spiral-shaped.

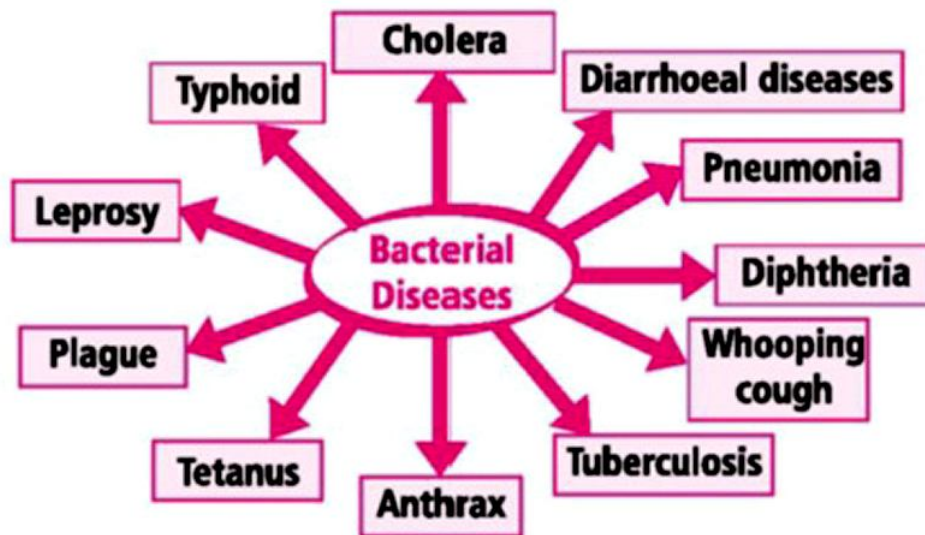
Most bacteria are not harmful and some are actually beneficial. Less than one per cent of bacteria will actually make you ill.

Infectious bacteria can grow, divide and spread in the body, leading to infectious disease.

Some infectious bacteria give off toxins which can make some diseases more severe.

Bacteria are spread in many ways including:

- Spread by aerosols (through coughing and sneezing). For example, Streptococcus.
- Spread by surface and skin contact. For example, Staphylococcus aureus, including MRSA.
- Spread through body fluids, such as blood and saliva. For example, meningococcal disease (meningitis).



Antibiotics are usually given to treat severe bacterial infections.
Antibiotic resistance in bacteria is a significant problem.

TYPHOID (ENTERIC FEVER)

- Typhoid is a common bacterial disease caused by a rodlike bacterium. *Salmonella typhi*, which is commonly found in the intestine of man.
- Certain humans function as carriers without suffering from it. Mary Mallon, called Typhoid Mary was such a case. She was a cook and typhoid carrier, who continued to spread the disease for several years through her food preparation.

Mode of transmission of Typhoid

- Incubation period varies from 1-3 weeks, average 2 weeks.
- Typhoid spreads through food and water contaminated with faeces of the patient. House flies may carry the pathogens from the faeces to the food, milk and water.

Symptoms of Typhoid

- This disease is characterised by the inflammation of ileum and colon, liver and spleen also become enlarged, abdominal pain, pea-soup diarrhoea which may become haemorrhagic, constant fever, extreme weakness, vomiting, rash of rose coloured spots called rose spots on the upper abdomen and sore throat.
- Typhoid is diagnosed by Widal Test.

Prevention and treatment Typhoid

- Any patient with typhoid requires the highest standards of nursing together with isolation and hygienic disposal of faeces.
- The two most important preventive measures are proper sewage treatment and purification of water supplies.
- Contamination of food can be reduced by personal hygiene and control of flies.
- TAB vaccine provides immunity for about 3 years.
- Antibiotics like ampicillin and chloramphenicol are used to treat typhoid.

CHOLERA

- Cholera commonly called haiza is a water-borne disease caused by the bacterium, *Vibrio cholerae*.
- Robert Koch discovered this disease.

Mode of transmission of Cholera

- Incubation period varies from a few hours to 2-3 days.

- It spreads through contaminated food and drinks.
- The causative bacterium secretes cholera toxin, enterotoxin which induces excessive secretion of an isotonic electrolyte solution by the intestinal mucosa. This solution is lost in stool.

Symptoms of Cholera

- Cholera is mainly characterized by sudden onset of profuse, effortless, rice-water like stools, vomiting and rapid dehydration, loss of minerals and muscular cramps.

Prevention and treatment of Cholera

- Proper sanitation and hygienic conditions are the best methods of prevention.
- Cholera vaccine is effective for six months only.
- Fluid and salt lost is restored by Oral Rehydration Solution (ORS). It is water with a small amount of sugar and salt.
- Antibiotics like tetracycline and chloramphenicol are used to treat cholera.

DIARRHOEAL DISEASES

- Diarrhoeal diseases are group of diseases caused by different bacteria such as Shigella dysenteriae, Escherichia coli, Campylobacter, Salmonella and Clostridium.

Mode of transmission of Diarrhoeal diseases

- Incubation period is variable.
- Epidemics are common in overcrowded insanitary conditions.
- It spreads through food poisoning, contaminated food, water or drinks, clothes, utensils and bed sheets.

Symptoms of Diarrhoeal diseases

- This is characterised by mild diarrhoea i.e., loose stools if infected by E. coli, frequent stools with blood and mucus and abdominal cramps if infected by Shigella. Other symptoms are dehydration, diminished appetite, fever, low B.P., increase in pulse rate etc.

Prevention and treatment of Diarrhoeal diseases

- One should avoid contaminated food and water.
- ORS is given repeatedly to check dehydration and loss of minerals.

PNEUMONIA

- Pneumonia is a serious disease of lungs characterised by accumulation of mucus/fluid in alveoli and bronchioles to that extent that breathing becomes difficult.
- It is caused by Streptococcus pneumoniae or Diplococcus pneumoniae, and Haemophilus influenzae.

Mode of transmission of Pneumonia

- Incubation period is of 1-3 days.
- A healthy person acquires the infection by inhaling the droplets/aerosols released by an infected person or even by sharing glasses and utensils with an infected person.

Symptoms

- The onset of pneumonia is usually sudden with a single shaking chill, followed by fever, pain with breathing on the side of lung involved, increased pulse and respiratory rates and cough.
- In severe cases the lips and finger nails turn grey to bluish in colour.

Prevention and treatment of Pneumonia

- The patients should be isolated and healthy persons should not share their belongings.

- Pneumococcal conjugate vaccine (PCV13) is available.
- Drugs against pneumonia are erythromycin, tetracycline and sulphonamide. If untreated, pneumonia leads to death.

DIPHTHERIA

- Diphtheria is an acute infectious disease in children mostly characterized by the development of a grey adherent false membrane over the upper respiratory tract or throat.
- It is caused by toxigenic strains of *Corynebacterium diphtheriae* (rod shaped, Gram +ve bacterium).

Mode of transmission of Diphtheria

- Incubation period is of 2- 5 days.
- Endotoxin produced by pathogen causes nasal diphtheria, pharyngeal diphtheria and laryngotracheal diphtheria.
- The germs are present in the discharges from the nose and throat of patients and also of healthy people who act as the “carriers”.
- The patients and the carriers spread the disease through acts like kissing, talking, coughing and sneezing.

Symptoms of Diphtheria

- Symptoms are fever, sore throat, sometimes vomiting, headache, epithelial necrosis by endotoxin and oozing of semisolid material in the throat which develops into a grey false but tough membrane.
- The membrane chokes the air passage. Sometimes, bacterium infects the heart, nerve cells and adrenal glands.
- In severe cases, respiratory tract is blocked causing difficulty in breathing and even death due to choking.
- ‘Schick test’ tests the presence of antitoxin and the state of hypersensitivity to diphtheria toxin.

Prevention and treatment of Diphtheria

- One should avoid close contact with the patient.
- DPT (diphtheria, pertussis and tetanus) vaccine is available.
- Erythromycin is used to treat diphtheria.

WHOOPING COUGH (PERTUSSIS)

- Whooping cough is caused by *Bordetella pertussis* and is a common childhood disease affecting the respiratory system.

Mode of transmission

- It has an incubation period of 10 – 16 days.
- It spreads by droplet infection or by direct contact.

Symptoms of Whooping cough (Pertussis)

- It causes loss of appetite, fever, running nose, fatigue, sneezing and constant cough leaving the child breathless, tired and red in face.
- Later the voice becomes hoarse and the cough gives a whoop or a loud crowing sound while inhaling.
- The child usually vomits and there is frothy discharge from his mouth and nose.
- There may be other complications like vomiting, convulsions and pneumonia.

Prevention and treatment of Whooping cough (Pertussis)

- Immunisation of the disease is done in infants by DPT vaccination at six weeks, three months and five months.
- Erythromycin antibiotic is used for the treatment.

TUBERCULOSIS

- Tuberculosis (TB), also called Koch's disease is caused by rod-shaped, Gram +ve bacteria, *Mycobacterium tuberculosis*.
- The bacterium releases a toxin, tuberculin which destroys the organs it infects.
- It can affect almost any tissue or organ in the body like the lungs, lymph nodes, brain, bones and joints but disease of the lung is by far the most frequent.

Mode of transmission of Tuberculosis

- Incubation period is 3 to 6 weeks or may be years.
- It spreads through sneezing, coughing, contaminated food and water.

Symptoms of Tuberculosis

- Constant cough and in severe cases sputum with blood, pain in chest while coughing, loss of body weight, failure of appetite, slight rise of temperature in the evening are the symptoms of lung T. B.
- Sputum, tuberculin, X-ray and gastric analysis are carried out to diagnose tuberculosis.
- Tuberculin test is also called Mantoux test.

Prevention and treatment of Tuberculosis

- BCG (*Bacillus Calmette Guerin*) vaccine for TB was obtained from bovine bacillus by Calmette and Guerin in 1921.
- Before giving vaccination to any individual it is important to check if they are already suffering from TB or have recovered from it.
- The test is to puncture the skin with a special instrument which has a ring of six short needles (the Heaf test). This introduces tuberculin, purified from dead tubercle bacilli.
- In the absence of past or present TB the skin shows no reaction, but if an individual has the disease or has recovered, then the skin swells and reddens at the injection site. This indicates a substantial immunity and no vaccine is offered.
- Some of the anti-tuberculosis drugs are streptomycin, rifampicin, isoniazid, thiatazone, PAS (Para amino salicydic acid) etc.
- Direct observation treatment (DOT) is a programme under WHO for treatment of TB across the world.

ANTHRAX (BIOWAR DISEASE)

- Anthrax is an acute infectious disease caused by airborne, spore-forming, rod-like, non-motile bacterium, *Bacillus anthracis*.
- *Bacillus anthracis* can be easily grown in the laboratory. Anthrax spores can be produced in a dry form which can be stored as particles.
- These particles can be used in biological warfare. Spores are infective in dry form, not in wet form.
- It most commonly occurs in wild and domestic vertebrates (cattle, sheep, goats, camels, antelopes, and other herbivores), but it can also occur in humans when they are exposed to infected animals or tissues from infected animals.

Mode of transmission of Anthrax (Biowar disease)

- Infected animals shed, a large number of bacilli (bacteria) in the discharges from the mouth, nose and rectum which sporulate in the soil. These spores are source of infection.
- It requires thousands of spores to cause human infection. Anthrax does not spread from human to human.

Types of Anthrax of Anthrax (Biowar disease)

- Anthrax infection can occur in three different forms: cutaneous (skin), gastrointestinal (by ingestion) and pulmonary (by inhalation).

(i) Cutaneous anthrax occurs when bacteria enter through skin cuts and wounds. A skin lesion begins as a papule and soon becomes a vesicle and breaks, discharging bloody serum. This vesicle, in about 36 hours, becomes a bluish-black necrotic mass (dead tissue). It consists of minute particles rich in spores.

(ii) Gastrointestinal anthrax is caused by taking under-cooked meat of infected animals. Patient experiences chill, high fever, body aches, nausea, vomiting, bloody diarrhoea, loss of appetite, and frequent haemorrhages from the mucous membranes and in the skin.

(iii) Pulmonary anthrax is acquired by inhaling dust containing *B. anthracis*. Pulmonary anthrax is often called wool-sorter's disease.

Symptoms of Anthrax (Biowar disease)

- Initial symptoms resemble those of common cold. Later there is difficulty in breathing, cough, fever, fast pulse and cardiovascular collapse.
- If left untreated, anthrax in all forms can lead to septicemia and death.
- Death is apparently due to oxygen depletion, secondary shock, increased vascular permeability, respiratory failure and cardiac failure.

Prevention and treatment of Anthrax (Biowar disease)

- The only known effective prevention against anthrax is the anthrax vaccine. The vaccine was developed from an attenuated strain *B. anthracis*.
- A suitable antibiotic like ciprofloxacin is quite effective, particularly if used in the initial stages of disease. But in cattle, ciprofloxacin may be effective only in chronic area.
- Antibiotics should be given to unvaccinated individuals exposed to pulmonary anthrax. Penicillin, tetracycline and fluoroquinolones are effective if administered before the onset of lymphatic spread or septicemia.

TETANUS (LOCK JAW)

- Lock jaw disease is caused by the spores of *Clostridium tetani* that enter through wounds.

Mode of transmission

- Incubation period is of 3-25 days during which the bacterium secretes a powerful exotoxin tetanospasmin into the tissue, and blood carries it to the central nervous system and brings about tetanus of muscles.
- Its infection is acquired by contamination of wounds with tetanus spores as these infected spores are abundant in the soil manured with animal dung.
- Spores may survive for 60 or more years in contaminated soil.

Symptoms of Tetanus (Lock jaw)

- Symptoms include painful muscular spasms especially of neck and jaw.
- Lock jaw condition occurs when the patient cannot open the mouth. Convulsions and paralysis of muscles, difficulty in chewing and swallowing, fever and headache are the other symptoms.

Prevention and treatment

- All wounds should be treated carefully and cleaned with iodine solution.
- Immunisation of infants by DPT should be done.
- ATS (antitetanus serum) injection within 24 hours of injury provides passive immunity while TT (tetanus toxoid) gives active immunity.

PLAGUE (BLACK DEATH)

- Plague is caused by a rod-shaped non-motile bacterium called *Pasteurella/Yersinia pestis* and is transmitted by the bite of infected rat flea, *Xenopsylla cheopis*.
- The first authenticated plague epidemics in India in modern times occurred in 1895-96 and from 1898 onwards the disease was appreciably manifest, reaching a peak in the year 1907.
- *Pasteurella pestis* endoparasite of gut of rat flea (which is an ectoparasite of rat and mouse).
- Head louse (*Pediculus*) and bedbug (*Cimex*) may also transmit the germs from man to man.

Prevention and treatment of Plague (Black death)

- Plague is confirmed by Wayson stain test.
- Anti-plague vaccine, spray of insecticides, killing of rats, nose caps and high cots (rat flea can jump upto 45 cm) are some preventive measures.
- Streptomycin or oral tetracycline is effective against plague.

LEPROSY (HANSEN'S DISEASE)

- Leprosy is a contagious chronic bacterial disease caused by *Mycobacterium leprae* which is characterised by the chronic infection of the skin and other tissues.

Mode of transmission of Leprosy (Hansen's disease)

- The incubation period is very long and averages upto 2-5 years.
- Infection occurs by prolonged contact with leprosy patients.
- The bacilli leave the body in nasal discharge, from the throat during coughing, sneezing and even speaking and through broken skin lesions.

Symptoms of Leprosy (Hansen's disease)

These include appearance of light coloured patches on the skin, thickening of the nerves, partial or total loss of sensation in the affected parts of the body.

- These are accompanied by fever, pain, ulcers and skin eruptions. Deformities of toes and fingers may also develop.

Lepromin test is used to evaluate leprosy using an intradermal injection of a lepromin. This test classifies the type of leprosy based on reaction.

- Tuberculoid leprosy gives positive test with lepromin while lepromatous leprosy is negative to lepromin test.

Prevention and treatment of Leprosy (Hansen's disease)

- No vaccine is available.
- Leprosy is treated with drugs like rifampicin, dapsone, and clofazimine.

FUNGI

Fungi are microorganisms characterised by cell walls made from a substance called chitin.

Most fungi are harmless to humans and some are edible.

Other fungi can be infectious and may lead to life-threatening diseases.

Fungi reproduce by releasing spores that can be picked up by direct contact or even inhaled.

Fungal infections often affect the lungs, skin or nails. Some infections may also penetrate the body to affect organs and cause whole-body infections.

Examples of fungal infections include:

- Athlete's foot: itching, scaling or cracking of the skin
- Ringworm: reddish, itchy, scaly rash usually on the skin and scalp
- Thrush: caused by the fungus *Candida albicans* which can infect the mouth, vagina, stomach and urinary tract.

Fungi that commonly cause skin diseases are called dermatophytes. “Dermatophytes” doesn't refer to a particular group of fungi, but rather to the fact that they attack the dermis, or skin. Fungal infections of the skin can be treated with topical creams as well as prescription drugs.

Athlete's Foot

The best-known fungal skin infection is athlete's foot. It infects approximately 10 percent of the United States population. It is most common among adolescents and adults; however, it may affect people of any age.

Athlete's foot can grow on the feet in different forms, including the following:

Interdigital: Infection occurs between the toes, with scaling, fissuring, or softened skin.

Moccasin: The fungi grows as a thick scaling over the entire sole of the foot (like a moccasin) and causes discomfort.

Vesicular: The fungi appear as small, itchy blisters near the instep.

Ulcerative: The infection involves peeling, oozing discharge, and a strong odor that usually starts as red, itchy swelling between the toes.

A good way to combat athlete's foot is to keep feet clean and dry. Topical powders or creams may also help to control infection. Unfortunately, athlete's foot is tough to eliminate and often comes back.

Summary of Human Fungal Diseases			
Disease	Symptoms	Fungus	Route of transmission
Athlete's foot	fluid-filled blisters, scaly skin, itching	<i>Trichophyton</i> species (Ascomycete) or <i>Epidermophyton</i> species	contact with skin lesions or contaminated floors
Ringworm	ring-shaped skin lesions	<i>Microsporum</i> , <i>Trichophyton</i> (Ascomycetes)	contact with skin lesions, contaminated floors, or contaminated objects
Vaginal yeast infection	burning sensation, itching, discharge	<i>Candida</i>	contact with fecal material, diabetes; antibiotic treatments increase susceptibility
Tinea cruris (jock itch)	intense itching, ring-shaped lesions	<i>Microsporum</i> , <i>Trichophyton</i> (Ascomycetes)	contact with skin lesions, contaminated floors, or contaminated objects
Histoplasmosis	fever, chills, headache, body aches, chest pains, nonproductive cough	<i>Histoplasma capsulatum</i> (Ascomycete)	inhalation of airborne conidia

Scalp Itch

Scalp itch is a fungal infection of the scalp and hair. It usually occurs in young children, but may appear in all age groups. It is contagious and may be spread from child to child in a school or day care setting.

An antifungal drug called riseofulvin cures scalp itch in one to three months.

Nail Fungus

Nail fungus is most common in adolescents and adults, especially among people who have frequent manicures. These infections can manifest themselves in a variety of patterns. Sometimes a portion of the nail becomes thick and brittle. Other times, the fungi attack the cuticle and the growth spreads out from there. This cuticle-based infection is common in AIDS patients.

PARASITES

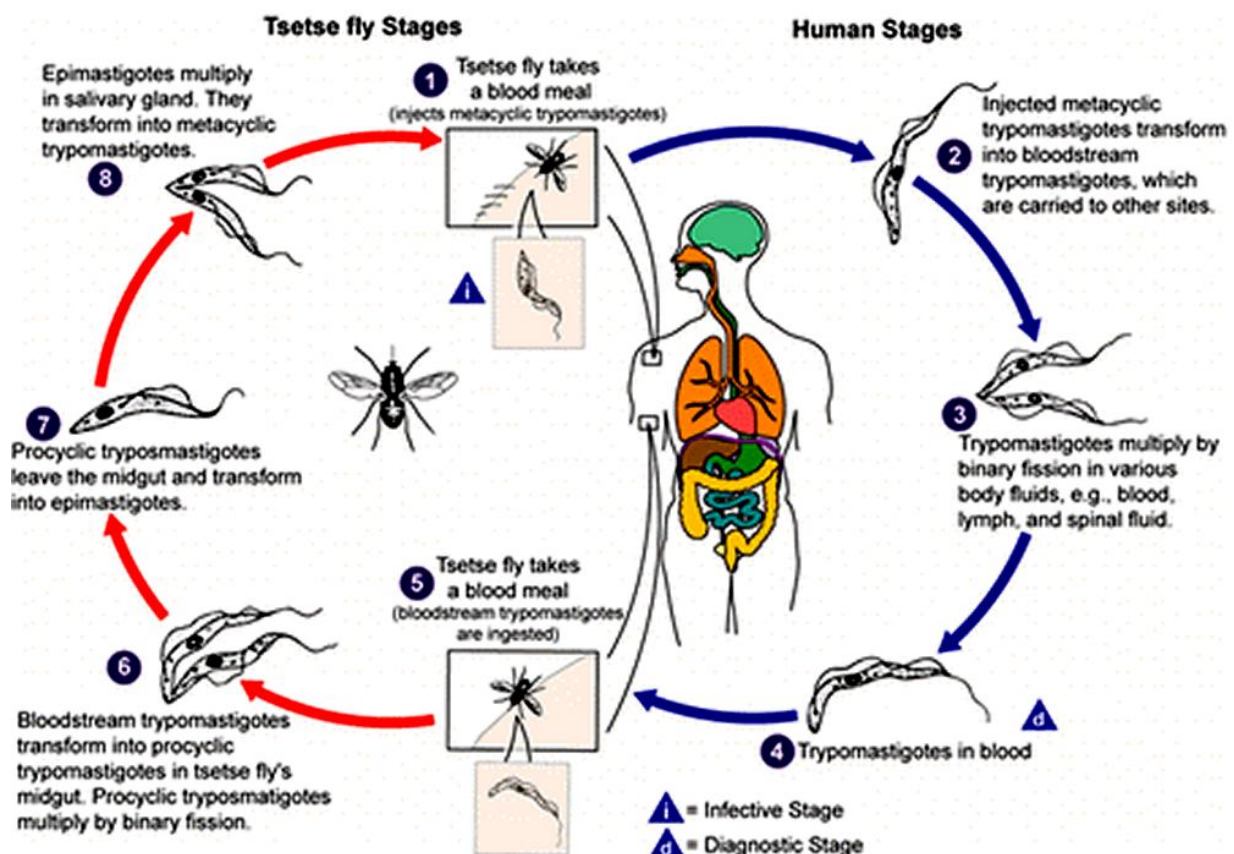
A parasite is an organism that lives off another organism, typically attaching itself to feed from the victim's blood, bowels, or other various bodily fluids. Parasitic diseases are more common than most people realize, and can strike anyone regardless of race, age, or social status. A certain amount of parasites are normally found on the skin and bedding of every human being. Dust mites, and other tiny, harmless mites, are commonly found in all household. Harmful parasites, however, can cause a great deal of damage to the human body if not properly treated.

PARASITIC DISEASES SYMPTOMS

Parasites such as roundworms feed off the human waste in the intestines. Symptoms of various worm infestation include itching, usually of the anus or vaginal area, weight loss, increased appetite, abdominal pain, bowel obstructions, vomiting, disturbed sleep, worms present in the stools or vomit, diarrhea, anemia, symptoms of pneumonia, food poisoning symptoms, aching muscles or joints, or a generally feeling of illness. These symptoms can range from barely noticeable to very severe.

PARASITIC DISEASES CAUSES

Parasitic disease is typically caused by the parasite's entry into the body via the skin or mouth. It is not unusual to pick up parasitic infections from soil, typically by either walking barefoot and allowing entry through the feet, or by placing the hands in the dirt and eventually placing the fingers in the mouth. Often people carry a parasite without ever knowing it.



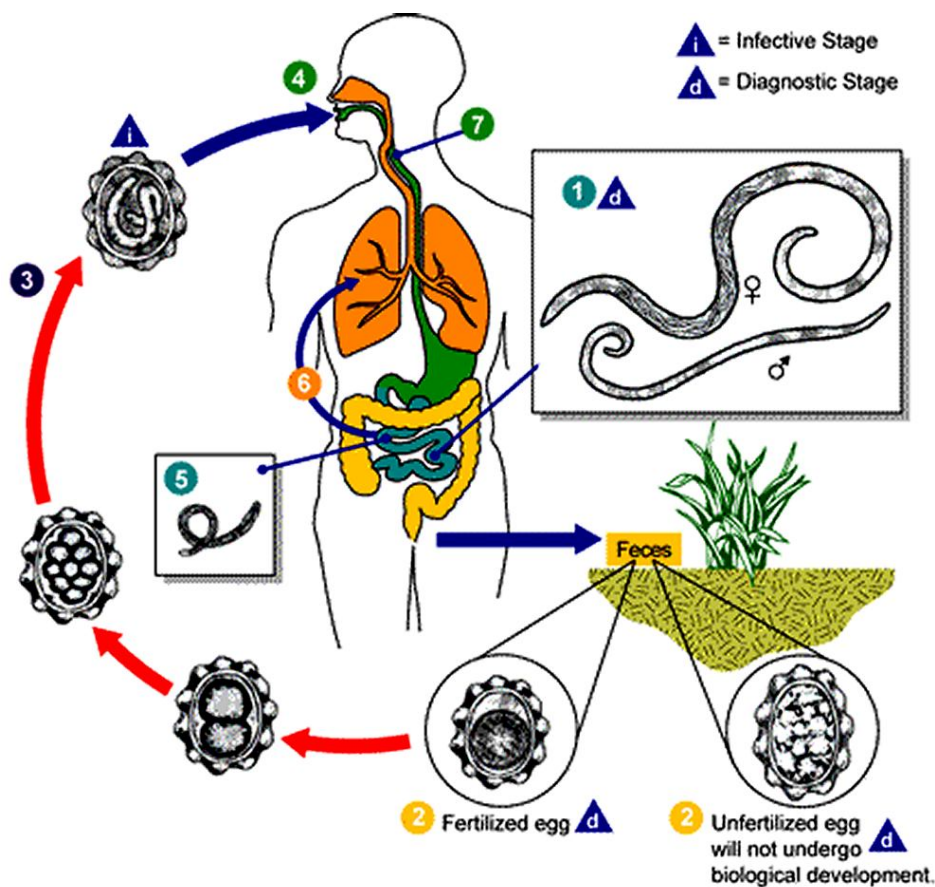
Parasites such as lice are caused through human contact with a person who is infected with lice. Ticks can be picked up through walking outdoors, close contact with a dog or cat, or being brought in from outside in various packages. Mosquitoes are parasites which simply attack humans for their blood and leave as quickly as they came.

PARASITIC DISEASES RISK FACTOR

Risk factors for parasites include children who play outdoors in the dirt, close contact with pets, farming, gardening, outdoor activities that include walking near wooded areas, digging in the dirt, walking outside barefoot, being in close or sexual contact with someone who has specific parasites, or sometimes simply the act of walking from the car to the house. Parasites exist in the world and can not be avoided simply by avoiding being outdoors. Parasites can be found in foods, especially undercooked or exotic foods.

Physicians typically do not screen for parasites without cause. Blood tests or fecal samples can determine parasites, but not all parasites. Pinworms require a nightly anal test, typically for three nights, where a sticky slide is placed on either side of the anus to pick up any eggs that have been laid. Analyzing the slide under a microscope can determine the presence of pinworm.

The majority of parasitic diseases are not dangerous. However, extreme cases may cause weight loss, dehydration from chronic diarrhea, symptoms which mimic pneumonia, anemia, fatigue, Lyme disease from ticks, Malaria from mosquitoes, or a host of uncomfortable bowel syndromes.



PARASITIC DISEASES TREATMENT

Treatment of parasitic disease is typically nothing. Most often there are no symptoms, or symptoms are so mild that there is no concern, and thus physicians are not told to consider the symptoms as a possible parasitic disease. Unless there are serious symptoms or the infestation is large enough to cause health problems, most parasitic diseases will clear up on their own.

For serious symptomatic cases, medication can be administered to kill the parasite or to relieve the symptoms caused by the parasite. Pinworm discomfort can be handled with an anti itch cream, while Lyme disease can only be treated by treating the symptoms. Medication such as mebendazole, pyrantel pamoate, and albendazole are effective medications in killing worm infestations.

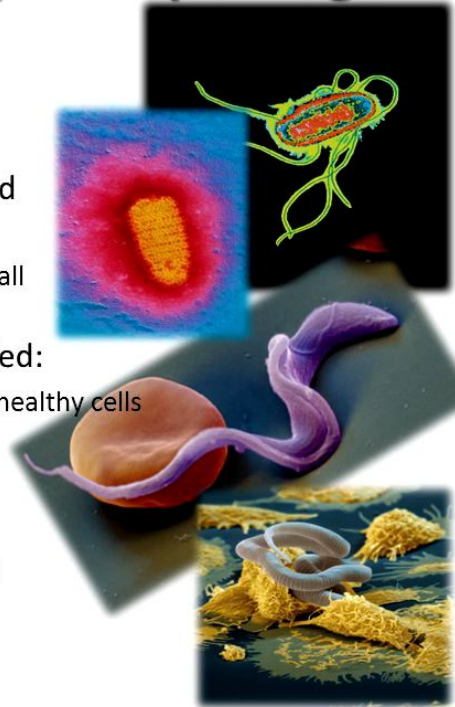
When dealing an infestation of worms or other parasites, self care can be as simple as keeping clean. Frequent bathing, cleaning clothes and bed clothes, wearing clean underclothing to bed, and checking for parasites are the best ways to deal with a parasitic disease. Washing hands frequently, especially after outdoor activities can help reduce the chances of a parasitic disease.

PARASITIC DISEASES PREVENTION

Coping with a parasitic disease can be stressful, more so when the patient believes that parasites come from being dirty. Parasites can be contracted regardless of the cleanliness of the home. While hand washing and overall cleanliness are positive ways to prevent parasitic infections and diseases, they in now way guarantee that parasites won't infect a family member.

There are different types of pathogens

- **Bacteria** are single-celled organisms:
 - Cause illness by destroying cells, release toxic chemicals
 - Ex: Food poisoning, MRSA
- **Viruses** are genetic material surrounded by a protein coat:
 - Force host cells to make more viruses, small
 - Ex: Flu, Cold, HIV
- **Fungi** can be multicellular or single-celled:
 - Take nutrients from host cells by piercing healthy cells
 - Occur in warm and damp places
 - Ex: Athlete's foot
- **Protozoa** are single-celled organisms.
 - Use host cells to complete their life cycles
 - Take nutrients from host cell
 - Ex: Malaria



Review: Parasite

Means of spread of infectious diseases :-

Infectious diseases spread from an infected person to a healthy person through air, water, food, vectors, physical contact and sexual contact.

i) Through air :- Common cold, Tuberculosis, Pneumonia etc.

ii) Through water :- Cholera, Amoebic dysentery etc.

iii) Through vectors :-


Mosquitoes :- Malaria, Dengue, Yellow fever etc.

Flies :- Typhoid, Tuberculosis, Diarrhoea, Dysentery etc.

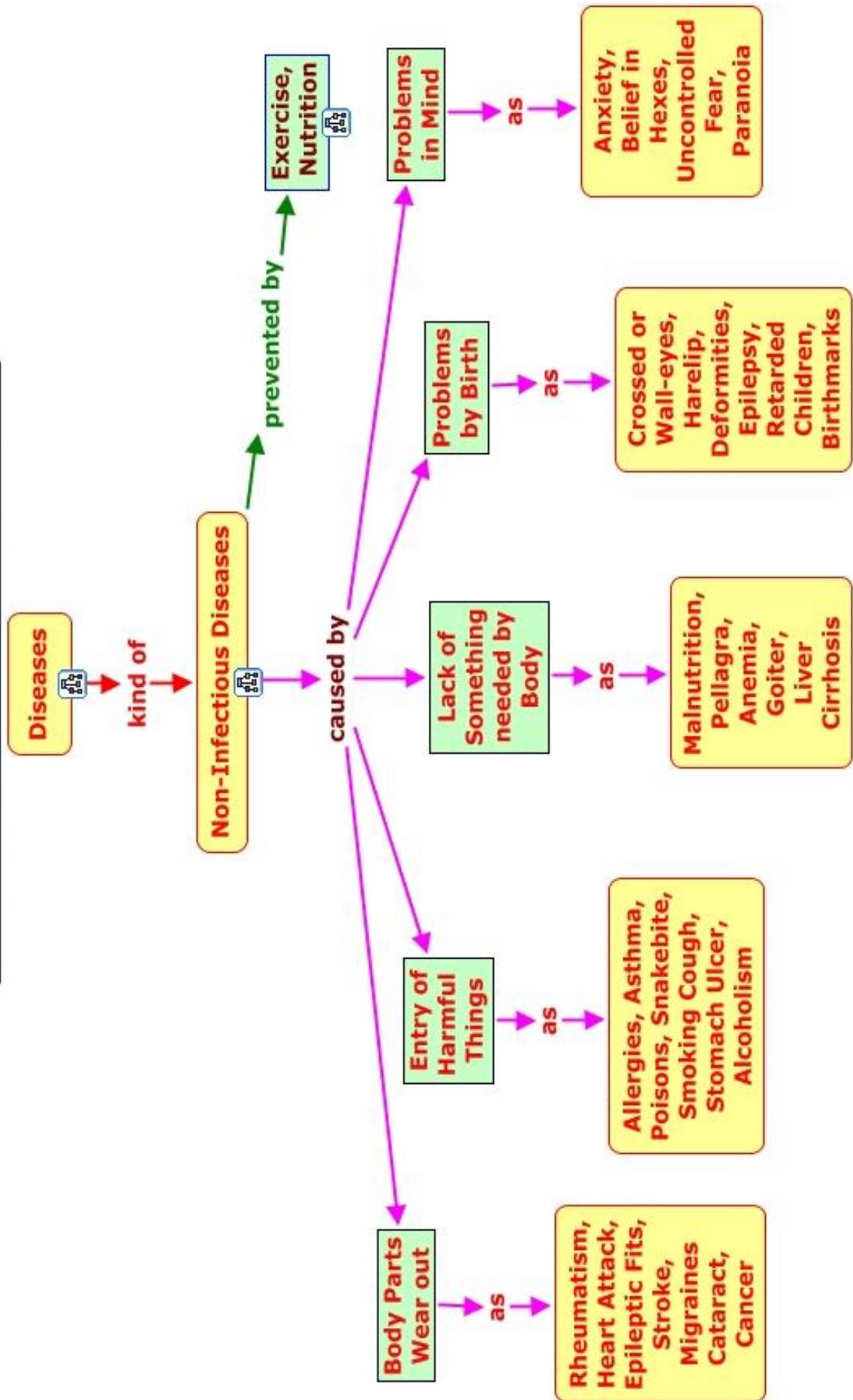
iv) Through sexual contact :- Syphilis, AIDS.

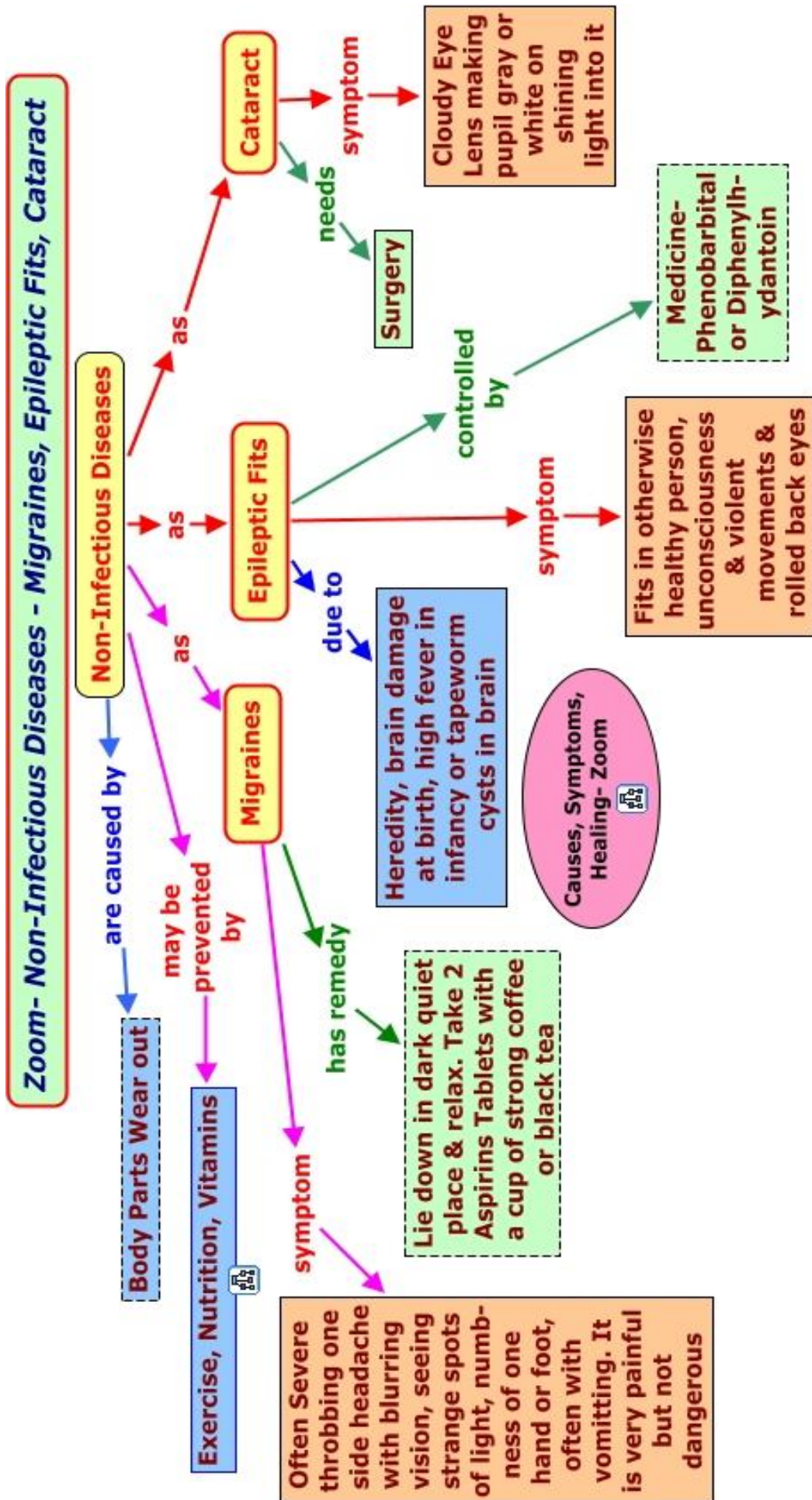
AIDS virus can also spread through blood transfusion and from the mother to her child during pregnancy and through breast feeding.

Infectious Diseases					This disease is spread by ...	Time between exposure and sickness	Early signs	How long is the child infectious?	Exclusion of child from kindergartens, schools, etc
Disease/ Infection					Coughing and sneezing and direct contact with respiratory droplets.	1-4 days	Sudden onset of fever with cough, sore throat, muscular aches and headache.	From 1 day before, up to 7 days after illness onset.	Restrict contact activities until well.†
*  Measles <small>Immunisation usually prevents this disease.</small>					Coughing and sneezing. Also direct contact with the nose/throat secretions of an infected person.	7-18 days, usually 10 days to onset and 14 days to rash	Running nose and eyes, cough, fever and a rash.	From the first day of illness until 4 days after the rash begins.	At least 4 days from onset of rash.
*  Meningitis <small>(Meningococcal)</small>					Close physical contact, such as kissing. Sleeping in the same room.	2-10 days, usually 3-4 days	Generally unwell, fever, headache, vomiting, sometimes a rash. Urgent treatment is required!	For 24 hours after antibiotics are started.	Until well enough to return.
*  Mumps <small>Immunisation usually prevents this disease.</small>					Contact with infected saliva, eg, coughing, sneezing, kissing and sharing food and drink.	12-25 days, usually 16-18 days	Pain in jaw, then swelling in front of ear and fever.	For one week before swelling appears until 9 days after.	Until 9 days after swelling develops, or until child is well, whichever is sooner.
*  Ringworm					Contact with infected person's skin, clothes or personal items. Also through contaminated floors and shower stalls.	10-14 days	Flat spreading ring-shaped lesions.	While lesions are present, and while fungus persists on contaminated material.	Restrict contact activities, eg, gym and swimming, until lesions clear.
*  Rubella <small>Immunisation usually prevents this disease.</small>					Coughing and sneezing. Also direct contact with the nose/throat secretions of an infected person.	14-23 days, usually 16-18 days	Fever, swollen neck glands and a rash on the face, scalp and body. Rubella during early pregnancy can cause abnormalities in the baby.	From 7 days before rash starts until at least 4 days after it has appeared.	7 days from appearance of rash.
*  Salmonella					Undercooked food (eg, chicken and meat); food/water contaminated with faeces from infected person or animal; direct spread from infected person or animal.	6-72 hours, usually 12-36 hours	Stomach pain, nausea, fever and diarrhoea.	Until well, and possibly weeks or months after.	Until well with no further diarrhoea.†
*  Scabies					Direct skin contact with the infected person, and sharing sheets and clothes.	Days-weeks	Itchy rash in places such as forearm, around waist, between fingers and buttocks and under armpits.	Until 24 hours after treatment is started.	24 hours after treatment is started.
*  Slapped cheek <small>(Human parvovirus infection)</small>					Coughing and sneezing. The virus may be passed from mother to child during pregnancy.	4-20 days	Red cheeks and lace-like rash on body.	For variable time up to appearance of rash.	Unnecessary unless child is unwell.
*  Streptococcal sore throat					Usually contact with the secretions of a strep sore throat. Sometimes through contaminated food.	1-3 days	Headache, vomiting, sore throat.	For 24 hours after antibiotics are started.	Until 24 hours after antibiotics started.
*  Whooping cough <small>(Pertussis)</small> <small>Immunisation usually prevents this disease.</small>					Coughing. Adults and older children may pass on the infection to babies.	5-21 days, usually 7-10 days	Running nose, persistent cough followed by "whoop", vomiting or breathlessness.	From runny nose stage and for 3 weeks after onset of cough if not treated with antibiotics, or until 5 days of antibiotic treatment.	21 days from onset of coughing, or after 5 days of antibiotics.

Infectious Diseases		This disease is spread by ...	Time between exposure and sickness	Early signs	How long is the child infectious?	Exclusion of child from kindergartens, schools, etc
*	Campylobacter	Undercooked food (eg, chicken and meat); food/water contaminated with faeces from infected person or animal. Direct spread from infected person or animal.	1–10 days, usually 2–5 days	Stomach pain, fever and diarrhoea.	Until well, and possibly several weeks after.	Until well with no further diarrhoea. [†]
	Chickenpox	Coughing and sneezing. Also direct contact with weeping blisters.	10–21 days, usually 14–16 days	Fever and spots with a blister on top of each spot.	From up to 5 days before appearance of rash until lesions have crusted (usually about 5 days).	For one week from date of appearance of rash. [†]
*	Conjunctivitis (viral or bacterial)	Direct contact with discharge from the eyes or with items contaminated by the discharge.	12 hours–12 days	Irritation and redness of eye. Sometimes there is a discharge.	While there is a discharge from the eyes, the child is infectious.	While there is a discharge from the eyes. [†]
	Cryptosporidium Giardia	Food or water contaminated with faeces from infected person or animal. Direct spread from infected person or animal.	Cryptosporidium 1–12 days, average about 7 days Giardia 3–25 days, usually about 7–10 days	Stomach pain and diarrhoea.	Until well, and possibly several weeks after. Giardia can be cleared by medication.	Until well with no further diarrhoea. [†]
*	Gastroenteritis (viral)	Food or water contaminated with faeces from infected person or animal. Direct spread from infected person.	1–3 days	Vomiting, diarrhoea and fever.	While vomiting and diarrhoea last, and up to 8 days after illness starts.	Until well with no further vomiting or diarrhoea. [†]
	Glandular fever	Transfer of saliva.	4–6 weeks	Sore throat, swollen glands in the neck, fever. Vague ill health for some time.	Prolonged – possibly for one year or more.	Until well enough to return.
*	Hand, foot and mouth disease	Coughing or poor hand washing. Direct spread from an infected person.	3–5 days	Fever, rash on soles and palms and in mouth. Flu-like symptoms.	While the child is unwell and possibly longer, because virus is excreted in faeces for weeks after.	While the child is feeling unwell. Unnecessary if the child is well. [†]
	Hepatitis A	Food or water contaminated with faeces from infected person. Direct spread from infected person.	15–50 days, usually 28–30 days	Nausea, stomach pains, general sickness. Jaundice a few days later.	From about 2 weeks before signs appear until 1 week after jaundice starts.	7 days from the onset of jaundice. [†]
*	 Hepatitis B <small>Vaccination usually prevents this illness.</small>	Close physical contact with the blood or body fluids of an infected person.	6 weeks–6 months, usually 2–3 months	Similar to Hepatitis A.	Blood and body fluids may be infectious several weeks before signs appear, until weeks or months later. A few people are infectious for years.	Until well. [†]
	Impetigo (School sores)	Direct contact with discharge from infected skin.	Usually a few days, variable	Scabby sores on exposed parts of body.	Until 24 hours after treatment with antibiotics has started or until sores are healed.	Until 24 hours after treatment has started. [†]

Zoom- Non-Infectious Diseases & Causes





INTEXT QUESTIONS PAGE NO. 178

Q1. State any two conditions essential for good health.

Answer:

Good health of a person depends on

- (i) social environment.
- (ii) public cleanliness.
- (iii) good economic conditions and earnings.
- (iv) social equality and harmony.

Q2. State any two conditions essential for being free of disease.

Answer:

The conditions essential for being free of diseases

- (i) Taking good food (balanced diet)
- (ii) Maintaining personal and public hygiene.

Q3. Are the answers to the above questions necessarily the same or different? Why?

Answer:

The answers are not same all the time. Because the meaning of health varies from person to person. For example, good health for a dancer may be being able to stretch his body into difficult but graceful positions. On the other hand, good health for a musician may mean having enough breathing capacity in his/her lungs to control his/her voice.

There is one similarity in both the cases. If the conditions essential for good health are maintained, then there are no chances of getting a disease.

INTEXT QUESTIONS PAGE NO. 180

Q1. List any three reasons why you would think that you are sick and ought to see a doctor. If only one of these symptoms were present, would you still go to the doctor? Why or why not?

Answer:

When there is a disease, its symptoms and signs appear. These symptoms may be headache, cough, loose-motions, wound with pus, etc. These symptoms indicate disease but do not tell what the disease is. So, it is advisable to go to the doctor to diagnose any signs of a disease on the basis of these symptoms. The doctor will get laboratory tests done, if required for the confirmation of a particular disease.

Q2. In which of the following case do you think the long-term effects on your health are likely to be most unpleasant?

If you get jaundice,

If you get lice,

If you get acne.

Why?

Answer:

Lice and acne will not cause long lasting effects on our body. But in case of jaundice, there will be severe long lasting effects. For example:

- (i) High temperature, headache and joint pains.
- (ii) Feeling of nausea and vomiting.
- (iii) Initiating rashes.

The patient will suffer from poor health and will recover by taking complete bed rest for sometime.

Q1. Why are we normally advised to take bland and nourishing food when we are sick?

Answer:

In case of illness, the normal functions of the body get disturbed. So, a nourishing food is required which is easily digestible and contains all the nutrients. Therefore, bland and nourishing food is advised to take during sickness.

Q2. What are the different means by which infectious diseases are spread?

Answer:

Infectious diseases spread by different means. These are:

- (i) **Through air** An infected person when sneezes or coughs releases droplets containing germs. These droplets infect another healthy person through air and microbes enter a new body. Examples of such diseases are common cold, pneumonia and tuberculosis.
- (ii) **Through water** If the water source is polluted by the excreta of infectious persons having gut diseases and this water is used by other people they will be infected by diseases. For example, cholera, amoebiasis, hepatitis spread through water.
- (iii) **Through sexual contact** Some diseases like AIDS and syphilis, etc., are transmitted by sexual contact. Other than this, AIDS virus also spread through blood, infected syringes, infected mother to her baby during pregnancy and through breast feeding.
- (iv) **Through vectors** There are some animals which act as intermediaries or vectors for a particular diseases. The vectors carry diseases from infected person to the healthy person. For example, mosquito spread malaria causing organism in humans, while sucking their blood.

Q3. What precautions can you take in your school to reduce the incidence of infectious diseases?

Answer:

To prevent the incidence of infectious diseases in school following precautions can be taken:

- (i) Avoid contact of students suffering from air borne diseases like common cold, cough, eye, flu, etc.
- (ii) By checking the availability of clean drinking water in school.
- (iii) Clean surroundings in school will not allow the growth and multiplication of vectors.
- (iv) Starting childhood immunisation programme in schools.

Q4. What is immunisation?

Answer:

Immunisation is a process of administration (injecting) of vaccine into a healthy person in order to develop immunity against a disease. Immunity means the ability of a body to recognise, destroy and eliminate external disease causing agents. This immunisation through administering vaccine is called vaccination. Vaccine contains disease-causing organisms in a diluted or weakened form or in living or dead form. It prevents further infection by microbes from causing the disease. The diseases like small pox, rabies, diphtheria chicken pox, polio, hepatitis are controlled by vaccination. Small pox is eliminated from the world through a world wide vaccination programme.

Q5. What are the immunisation programmes available at nearest health centre in locality? Which of these diseases are the major health problems in your area?

Answer:

The following immunisation programme is available at the nearest health centre in our locality

- (i) Immunisation for infants—DPT, BCG, polio, measles and MMR.
- (ii) For children—Typhoid, TT, DT, small pox and TAB.
- (iii) For pregnant woman— TT and hepatitis-B.

The diseases like typhoid, polio, measles, tetanus are the major health problems in our locality. To prevent these diseases, our government have initiated expanded immunisation programme all over the country.

EXERCISE QUESTIONS PAGE NO. 188

Q1. How many times did you fall ill in the last one years? What were the illnesses?

(a) Think of one change you could make in your habits in order to avoid any of/most of the above illnesses.

(b) Think of one change you would wish for in your surroundings in order to avoid any of/most of the above illnesses.

Answer: I fell ill twice in the last one year. The disease, I first suffered from was diarrhoea and secondary the dengue fever.

(a) The changes I brought in my habits after suffering from these disease to protect myself in near future are

(i) I will always drink clean, pure water and wash hands before eating anything.

(ii) I will live in clean surroundings where disease spreading vectors could not multiply. For example, mosquitoes.

(b) Pure drinking water should be available always. The intake of impure water is the main cause of many infectious diseases.

Q2. A doctor/nurse/health-worker is exposed to more sick people than others in the community. Find out how she/he avoids getting sick herself/himself.

Answer: A doctor/nurse/health-worker take following precautions to avoid become sick themselves

(i) Wear masks while diagnosing mouth or chest infections.

(ii) Clean their hands and wear gloves even while doing minor surgeries.

(iii) Get immunisation done against all the infectious diseases.

(iv) Take balanced diet (rich in proteins especially) to strengthen their immune system.

(v) Dispose off blood samples, urine or stool, sputum, etc., carefully.

Q3. Conduct a survey in your neighbourhood to find out what the three most common diseases are. Suggest three steps that could be taken by your local authorities to bring down the incidence of these diseases.

Answer: I conducted a survey in my neighbourhood and found following three most common diseases.

Diseases	Symptoms	Steps could be Taken by Local Authorities to Bring Down the Incidence
Typhoid	Headache and fever which remains high in the second week and then declines	<ul style="list-style-type: none"> ➤ Proper hygiene in surrounding areas of living. ➤ Safe disposal of excreta and other wastes. ➤ Providing TAB and typhoid oral vaccine.
Cholera	Painless watery diarrhoea, effortless vomiting	<ul style="list-style-type: none"> ➤ Good sanitary condition in community. ➤ Provision of clean, purified drinking water. ➤ Providing standard cholera vaccination in the locality.
Dengue fever	High fever with headache, weakness and joint pains	<ul style="list-style-type: none"> ➤ Maintenance of hygienic conditions in community . ➤ Preventing the mosquito breeding sites. ➤ Public awareness programme against mosquito borne diseases.

Q4. A baby is not able to tell her/his caretakers that she/he is sick. What would help us to find out (a) that the baby is sick? (b) What is the sickness?

Answer:

- (a) Symptoms to help in finding out that the baby is sick are:
- (i) continuous crying
 - (ii) drooping of eyes
 - (iii) redness of eyes
 - (iv) high temperature of body.
- (b) Signs which help to indicate the sickness in baby
- (i) loose motions, stomach pain indicate diarrhoea.
 - (ii) high fever, headache, muscular pain, feeling of shivering and cold indicate malaria.
 - (iii) redness and persistent rubbing of eyes indicate eye flu.
 - (iv) pale skin, yellow urine, yellowing of eyes indicate jaundice.
 - (v) doctors suggest for laboratory tests, if there is fever with no other symptoms to find out the kind of sickness.

Q5. Under which of the following conditions is a person most likely to fall sick?

(a) When she is recovering from malaria.

(b) When she has recovered from malaria and is taking care of someone suffering from chicken pox.

(c) When she is on a four-day fast after recovering from malaria and is taking care of someone suffering from chicken pox. Why?

Answer:

In condition (c), a person is most likely to fall sick. The reasons are:

- (a) Due to malaria, the body becomes weak and loss of body fluids occur. In this condition, it she takes four days fast, her recovery from malaria related weakness will not occur and she will become more weak.
- (b) Her immune system is already weak due to malaria and if she takes care of someone suffering from chicken pox, there is high probability that she may also suffer this diseases.

Q6. Under which of the following conditions are you most likely to fall sick?

(a) When you are taking examinations.

(b) When you have travelled by bus and train for two days.

(c) When your friend is suffering from measles. Why?

Answer:

In condition (c), Charles of falling sick are maximum. Measles is an infectious viral disease of young children which spreads through nasal or throat discharge. In contact of a friend suffering from measles can cause you sick.

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ASSIGNMENT QUESTIONS SET – 1
CHAPTER – 13
WHY DO WE FALL ILL

1. Which one of the following is an infectious disease?
 - (a) diptheria
 - (b) diabetes
 - (c) hypertension
 - (d) cancer
2. Elephantiasis disease can have
 - (a) short-term affect on our health
 - (b) no effect on our health
 - (c) long term affect on our health
 - (d) sometimes bad effect on our health
3. Ascaris worm lives in which part of human body?
 - (a) kidneys
 - (b) liver
 - (c) small intestine
 - (d) large intestine
4. Microbes which enter the body through nose most likely affect
 - (a) liver
 - (b) heart
 - (c) brain
 - (d) lungs
5. Which of the following is a viral infection?
 - (a) Dipteria
 - (b) Influenza
 - (c) Cholera
 - (d) Typhoid
6. HIV virus when active in body mainly attacks on
 - (a) lungs
 - (b) liver
 - (c) immunity
 - (d) nerves
7. An Organism which carries pathogens is termed as
 - (a) host

- (b) vector
 - (c) parasite
 - (d) predator
- 8.** Diseases which are always present in certain location are called?
- (a) epidemic diseases
 - (b) endemic diseases
 - (c) acute diseases
 - (d) chronic diseases
- 9.** DPT vaccines are administered to develop immunity against
- (a) Tetanus
 - (b) Diphtheria
 - (c) Pertussis
 - (d) All of these
- 10.** Anti-viral drugs are difficult to make because, viruses
- (a) live outside the host cells
 - (b) live inside the host cells
 - (c) live in consumed food particles
 - (d) live in blood stream
- 11.** BCG vaccine is used to develop immunity against
- (a) jaundice
 - (b) polio
 - (c) influenza
 - (d) tuberculosis
- 12.** Which of the following is a communicable disease?
- (a) Rickets
 - (b) Scurvy
 - (c) Marasmus
 - (d) Cholera
- 13.** The causative organism for malaria is a:
- (a) bacteria
 - (b) protozoa
 - (c) virus
 - (d) fungi
- 14.** Vaccination helps in controlling diseases because
- (a) it develops resistance against the pathogen attack

- (b) it kills the pathogens causing disease
 - (c) it blocks the food supplied to pathogens
 - (d) it does not allow pathogens to multiply in hosts
- 15.** ORS is given in
- (a) diarrhoea
 - (b) measles
 - (c) typhoid
 - (d) tetanus
- 16.** Which of the following is an example of nutritional deficiency disease?
- (a) Hypertension
 - (b) Rickets
 - (c) Diabetes
 - (d) Gastroenteritis
- 17.** Define Health? What do you interpret when we say a person is in good health?
- 18.** State any two conditions essential for good health.
- 19.** What are three dimensions of health? Are they interrelated?
- 20.** Kidneys of a person do not filter urine properly. How does it affect physical, mental and social dimensions of that person?
- 21.** State any two conditions essential for being free of disease.
- 22.** Are the answers to the above questions (Q2 and Q5) and necessarily the same or different? Why?
- 23.** What is a balanced diet?
- 24.** A hefty boy of 12 years often picks fights with others. Do you think he is in good health? If so, then explain your answer.
- 25.** How do you define 'disease'?
- 26.** State and explain in brief the four major factors, which are the causes of disease.
- 27.** Is there any difference between 'being healthy' and 'disease free'?
- 28.** How do we identify a disease?
- 29.** What is the difference between symptoms and signs of a disease?
- 30.** List any three reasons why you would think that you are sick and ought to see a doctor. If only one of these symptoms were present, would you still go to the doctor? Why or why not?
- 31.** Based on duration or persistence, how diseases are categorised?
- 32.** Give examples of Acute diseases.
- 33.** Give four examples of Chronic diseases.

34. Differentiate between Acute Diseases and Chronic Diseases.
35. What are congenital diseases? Give two examples of such disease.
36. Name a disease which was earlier considered to be chronic but now can be treated in short duration?
37. A baby is not able to tell her/his caretakers that she/he is sick. What would help us to find out (a) that the baby is sick? (b) what is the sickness?
38. What are acquired diseases?
39. Write few common signs and symptoms of a disease if brain is affected.
40. List any two differences between infectious and non-infectious diseases. Write any one example of each disease.
41. What are infectious agents? What are the different infectious agents?
42. What is 'germ theory of disease'? Who proposed it?
43. What are Koch's Postulates?
44. List the diseases caused by viruses?
45. Give three examples of bacterial diseases.
46. Give examples of fungal diseases.
47. List three diseases caused by protozoans.
48. Name the pathogen causes peptic ulcer.
49. List the diseases caused by worms?
50. Name the the protozoan pathogen that causes kala-azar.
51. Name the microbe which causes acne.
52. What is the scientific name of roundworm? Where do we find it commonly in human body? Name the disease caused by it.
53. Why is it important that we think of these categories of infectious agents?
54. How do antibiotics (say Penicillin) work on bacteria but not on human beings?
55. Define antibiotic? Explain how it is able to control bacterial infections but not viral infections.
56. Explain why antibiotics are more effective in curing bacterial diseases than viral diseases.
57. Why taking an antibiotic is not effective in the common cold?
58. Give two examples of bacterial antibiotics.
59. Give an example of fungal antibiotic.
60. Why are we normally advised to take bland and nourishing food when we are sick?
61. What are the different means by which infectious diseases are spread?
62. If a person has persistent cough and breathlessness, most likely which of the following organ is affected

- 63.** What is the alternate name of brain fever? Which vector is responsible for this disease?
- 64.** Name the vector which causes malaria.
- 65.** Name the vector which causes dengue, chikengunia and yellow fever.
- 66.** Name the vector that can cause sleeping sickness.
- 67.** Name the diseases that can spread through housefly.
- 68.** Name the vectors which can cause rabies.
- 69.** A doctor/nurse/health-worker is exposed to more sick people than others in the community.
Find out how she/he avoids getting sick herself/himself.
- 70.** What precautions can you take in your school to reduce the incidence of infectious diseases?
- 71.** What do you mean by immunity?
- 72.** What is immunisation?
- 73.** What is antigen?
- 74.** What are antibodies?
- 75.** What is colostrum? Why is mothers milk strongly advised to new borns?
- 76.** What are the immunisation programmes available at the nearest health centre in your locality? Which of these diseases are the major health problems in your area?
- 77.** What are epidemic and endemic diseases?
- 78.** Which organ is affected if a person is suffering from jaundice?
- 79.** What do you mean by Phagocytosis?
- 80.** Why is it not necessary to give Hepatitis A vaccine to children?
- 81.** What are the basic principles involved in medical treatment for diseases?
- 82.** Why it is advisable to breast feed the baby for first few several weeks? Why Colostrum is good for infants?
- 83.** How do Skin, Hairs, Saliva form the first line of defense against diseases?
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ASSIGNMENT QUESTIONS SET – 2
CHAPTER – 13
WHY DO WE FALL ILL

1. What does the word health mean?
2. Name any two Symptoms of diseases..... (Cough& loose motions)
3. The disease which last for only a short period of time is called.....(Acute Disease)
4. State whether Tuberculosis is aChronic Disease or Acute Disease..... (Chronic Disease)
5. Mention the causal organism for Sleeping sickness (Trypanosoma)
6. Sleeping sickness is caused by.....
7. Elephantiasis is caused by.....
8. Mention two Air born diseases1.....2.....
9. Mention two Sexually Transmitted Diseaes1.....2.....
10. Mention two Viral Diseaes1.....2.....
11. What is called vector. Give one example.
12. Give two examples of Chronic diseases.
13. Distinguish between Infectious and Non-infectious diseases.
14. Write a short notes on Small Pox.
15. What is immunity? Write short notes on it.
16. What is Vaccination? Give the details, how it works in human body.
17. Write three reasons for Cancers.
18. What are the basic five principles of treatment for diseases.
19. How Hygiene could help you to maintain good health and mention five situations to take care about health.
20. How does the health of an organism depend upon the surroundings?
21. What do we mean by “disease”?
22. What are symptoms?
23. How do you distinguish between acute and chronic diseases?
24. What are the various causes of diseases?
25. Name some common infectious diseases
26. Explain the effect of antibiotic penicillin on bacterial cells.
27. Why are human cells not affected by penicillin?
28. Why are antibiotics ineffective against viruses?
29. How do communicable or infectious diseases spread?
30. How does AIDS spread?

31. What are vectors? Name some vector transmitted diseases.
32. The disease-causing microbes enter the body through different means. Where do they go then?. Do all microbes go to the same tissue or organ, or do they go to different ones?
33. The signs and symptoms of a disease depend upon the tissue or organ targeted. Explain.
34. How does HIV damage our body?
35. How do we kill microbes?
36. What feature of our body protects us from catching infectious diseases?
37. Describe the principle behind vaccination.
38. Name some diseases for which vaccines are available.
39. Who were awarded nobel prize for discovery of treatment of peptic ulcer?
40. List some general principles of prevention.
41. State any two conditions essential for good health.
42. State any two conditions essential for being free of disease.
43. Are the answers to the above questions necessarily the same or different? Why?
44. List any three reasons why you would think that you are sick and ought to see a doctor. If only one of these symptoms were present, would you still go to the doctor? Why or why not?
45. In which of the following case do you think the long-term effects on your health are likely to be most unpleasant? a) if you get jaundice, b) if you get lice, c) if you get acne. Why?
46. Why we are normally advised to take bland and nourishing food when we are sick?
47. How are acute diseases different from chronic diseases?
48. What is the full form of AIDS? Name the causal organism.
49. State two conditions essential for keeping good health.
50. Define (a) health (b) disease.
51. Why are antibiotics not effective for viral disease?
52. Explain giving reasons –(a) Balanced diet is necessary for maintaining health body. (b) Health of an organism depends upon the surrounding environmental conditions.
53. Explain the Natural and acquired immunity?
54. What are the two ways to treat and infectious disease?
55. What do the sign and symptoms indicate if person is suffering from any disease? Based on the duration of diseases what are the difference between categories of diseases? Diffrentiate between them giving one example of each.

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ASSIGNMENT QUESTIONS SET – 3
CHAPTER – 13
WHY DO WE FALL ILL

1. Which one of the following is not a viral disease?
 - (a) Dengue
 - (b) AIDS
 - (c) Typhoid
 - (d) Influenza
2. Which one of the following is not a bacterial disease?
 - (a) Cholera
 - (b) Tuberculosis
 - (c) Anthrax
 - (d) Influenza
3. Which one of the following disease is not transmitted by mosquito?
 - (a) Brain fever
 - (b) Malaria
 - (c) Typhoid
 - (d) Dengue
4. Which one of the following disease is caused by bacteria?
 - (a) Typhoid
 - (b) Anthrax
 - (c) Tuberculosis
 - (d) Malaria
5. Which one of the following diseases is caused by protozoans?
 - (a) Malaria
 - (b) Influenza
 - (c) AIDS
 - (d) Cholera
6. Which one of the following has a long term effect on the health of an individual?
 - (a) Common cold
 - (b) Chicken pox
 - (c) Chewing tobacco
 - (d) Stress
7. Which of the following can make you ill if you come in contact with an infected person?
 - (a) High blood pressure
 - (b) Genetic abnormalities
 - (c) Sneezing
 - (d) Blood cancer

8. AIDS cannot be transmitted by
- (a) sexual contact
 - (b) hugs
 - (c) breast feeding
 - (d) blood transfusion
9. Making anti-viral drugs is more difficult than making anti-bacterial medicines because
- (a) viruses make use of host machinery
 - (b) viruses are on the border line of living and non-living
 - (c) viruses have very few biochemical mechanisms of their own
 - (d) viruses have a protein coat
10. Which one of the following causes kala-azar?
- (a) *Ascaris*
 - (b) *Trypanosoma*
 - (c) *Leishmania*
 - (d) Bacteria
11. If you live in a overcrowded and poorly ventilated house, it is possible that you may suffer from which of the following diseases
- (a) Cancer
 - (b) AIDS
 - (c) Air borne diseases
 - (d) Cholera
12. Which disease is not transmitted by mosquitoes?
- (a) Dengue
 - (b) Malaria
 - (c) Brain fever or encephalitis
 - (d) Pneumonia
13. Which one of the following is not important for individual health?
- (a) Living in clean space
 - (b) Good economic condition
 - (c) Social equality and harmony
 - (d) Living in a large and well furnished house
14. Choose the wrong statement
- (a) High blood pressure is caused by excessive weight and lack of exercise.
 - (b) Cancers can be caused by genetic abnormalities
 - (c) Peptic ulcers are caused by eating acidic food
 - (d) Acne is not caused by staphylococci
15. We should not allow mosquitoes to breed in our surroundings because they
- (a) multiply very fast and cause pollution
 - (b) are vectors for many diseases
 - (c) bite and cause skin diseases
 - (d) are not important insects

- 16.** You are aware of Polio Eradication Programme in your city. Children are vaccinated because
- (a) vaccination kills the polio causing microorganisms
 - (b) prevents the entry of polio causing organism
 - (c) it creates immunity in the body
 - (d) all the above
- 17.** Viruses, which cause hepatitis, are transmitted through
- (a) air
 - (b) water
 - (c) food
 - (d) personal contact
- 18.** Vectors can be defined as
- (a) animals carry the infecting agents from sick person to another healthy person
 - (b) microorganisms which cause many diseases
 - (c) infected person
 - (d) diseased plants
- 19.** Give two examples for each of the following
- (a) Acute diseases
 - (b) Chronic diseases
 - (c) Infectious diseases
 - (d) Non-infectious diseases
- 20.** Name two diseases caused by Protozoans. What are their causal organisms?
- 21.** Which bacterium causes peptic ulcers? Who discovered the above pathogen for the first time?
- 22.** What is an antibiotic? Give two examples
- 23.** Fill in the blanks
- (a) Pneumonia is an example of _____ disease.
 - (b) Many skin diseases are caused by_____.
 - (c) Antibiotics commonly block biochemical pathways important for the growth of _____.
 - (d) Living organisms carrying the infecting agents from one person to another are called ———.
- 24.** Name the target organs for the following diseases
- (a) Hepatitis targets———.
 - (b) Fits or unconsciousness targets ———.
 - (c) Pneumonia targets ———.
 - (d) Fungal disease targets ———.
- 25.** Who discovered ‘vaccine’ for the first time? Name two diseases which can be prevented by using vaccines.
-
-

26. Fill in the blanks

- (a) ——— disease continues for many days and causes——— on body.
- (b) ———disease continues for a few days and causes no longer term effect on body.
- (c) ——— is defined as physical, mental and social well-being and comfort.
- (d) Common cold is——— disease.
- (e) Many skin diseases are caused by———.

27. Classify the following diseases as infectious or non-infectious.

- (a) AIDS
- (b) Tuberculosis
- (c) Cholera
- (d) High blood pressure
- (e) Heart disease
- (f) Pneumonia
- (g) Cancer

28. Name any two groups of micro-organisms from which antibiotics could be extracted.

29. Name any three diseases transmitted through vectors.

30. Explain giving reasons

- (a) Balanced diet is necessary for maintaining healthy body.
- (b) Health of an organism depends upon the surrounding environmental conditions.
- (c) Our surrounding area should be free of stagnant water.
- (d) Social harmony and good economic conditions are necessary for good health.

31. What is a disease? How many types of diseases have you studied? Give examples.

32. What do you mean by disease symptoms? Explain giving two examples?

33. Why is immune system essential for our health?

34. What precautions will you take to justify “prevention is better than cure”.

35. Why do some children fall ill more frequently than others living in the same locality?

36. Why are antibiotics not effective for viral disease?

37. Becoming exposed to or infected with an infectious microbe does not necessarily mean developing noticeable disease. Explain.

38. Give any four factors necessary for a healthy person.

39. Why is AIDS considered to be a ‘Syndrome’ and not a disease?

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CHAPTER – 14

NATURAL RESOURCES

RESOURCES ON THE EARTH

Biosphere:

The whole combination of animals, plants and non-living beings which by their interaction make the planet earth a live and vibrant place is called biosphere.

Biotic Components:

Living things constitute the biotic component of the biosphere.

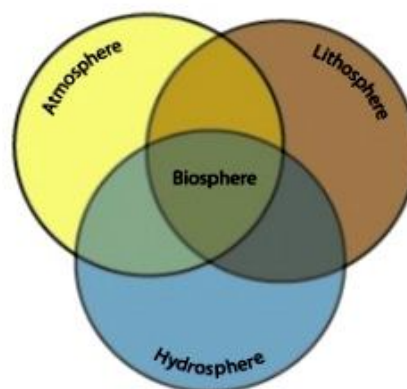
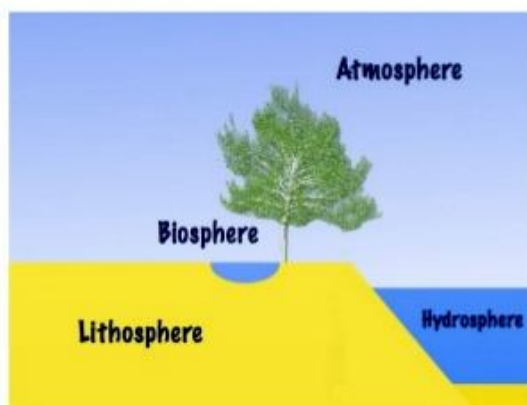
Abiotic Components:

The air, the water and the soil form the non-living or a biotic component of the biosphere. The air is called the hydrosphere, the water is hydrosphere and the soil is called lithosphere.

Resources on the earth

The natural resources of the earth are air, water, soil, minerals and living organisms.

The outer crust of the earth is the **lithosphere**. The water on the earth is the **hydrosphere**. The layer of the air around the earth is the **atmosphere**. Living organisms are found where the atmosphere, hydrosphere and lithosphere interact and is the **biosphere**.

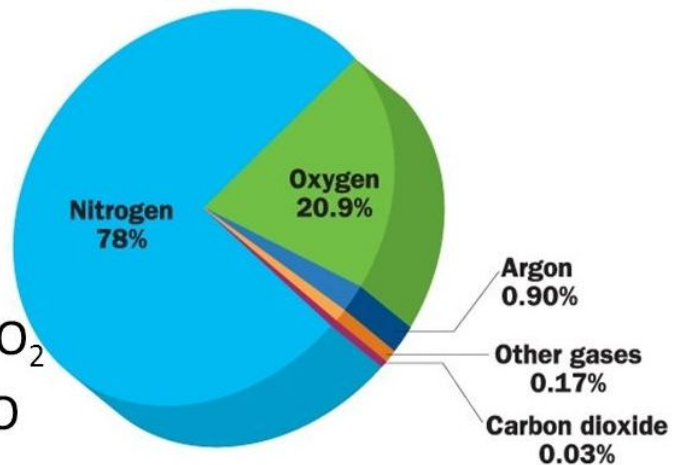


AIR

Air is a mixture of many gases like nitrogen, oxygen, carbon dioxide and water vapour. All living beings need oxygen to break down glucose molecules and get energy for their activities. This results in the production of carbon dioxide. Another process which results in the consumption of oxygen and the concomitant production of carbon dioxide is combustion. This includes not just human activities, which burn fuels to get energy, but also forest fires. Despite this, the percentage of carbon dioxide in our atmosphere is a mere fraction of a percent because of carbon dioxide fixation.

Air is a mixture of different gasses

- Nitrogen N_2
- Oxygen O_2
- Noble Gasses Ar
- Carbon Dioxide CO_2
- Water Vapour H_2O

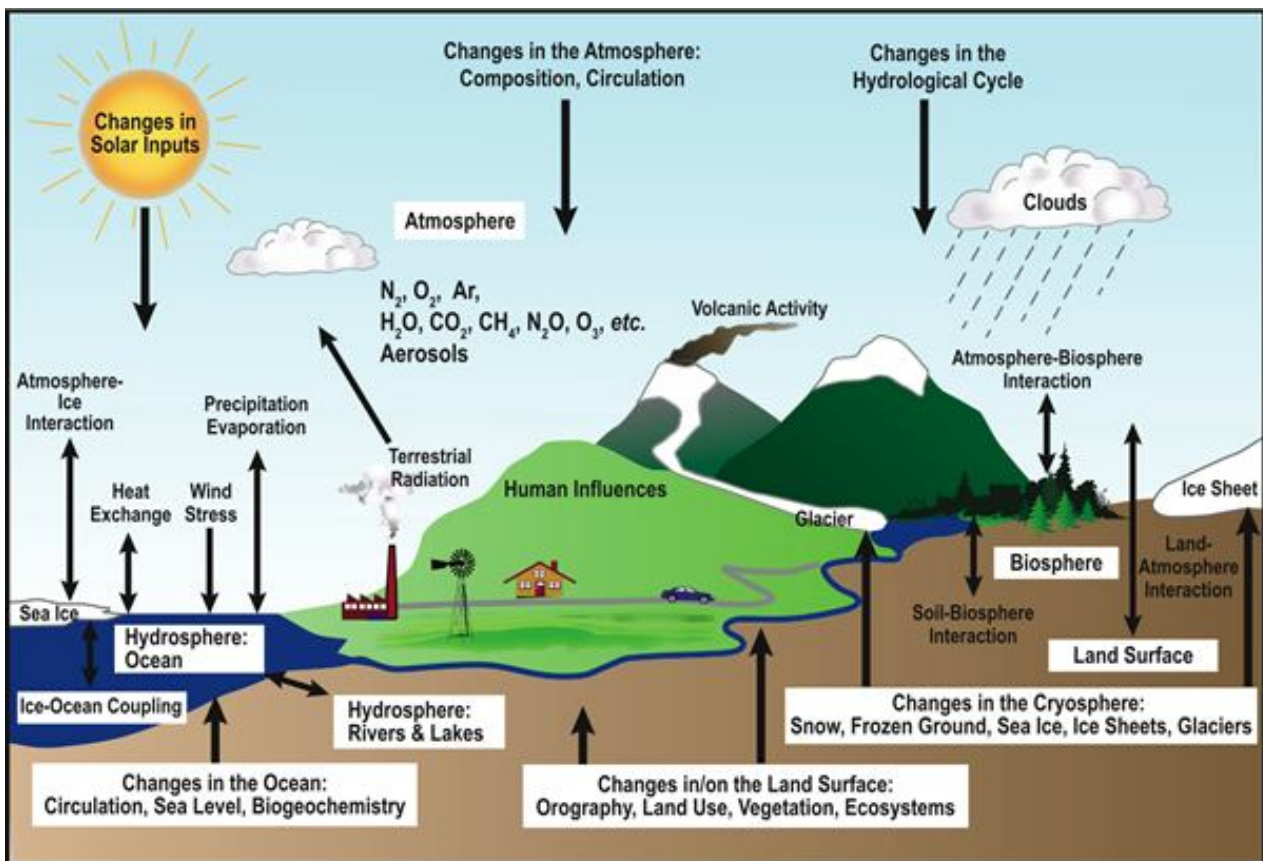


Carbon Dioxide Fixation

- (i) Green plants convert carbon dioxide into glucose in the presence of Sunlight and
- (ii) Many marine animals use carbonates dissolved in sea-water to make their shells.

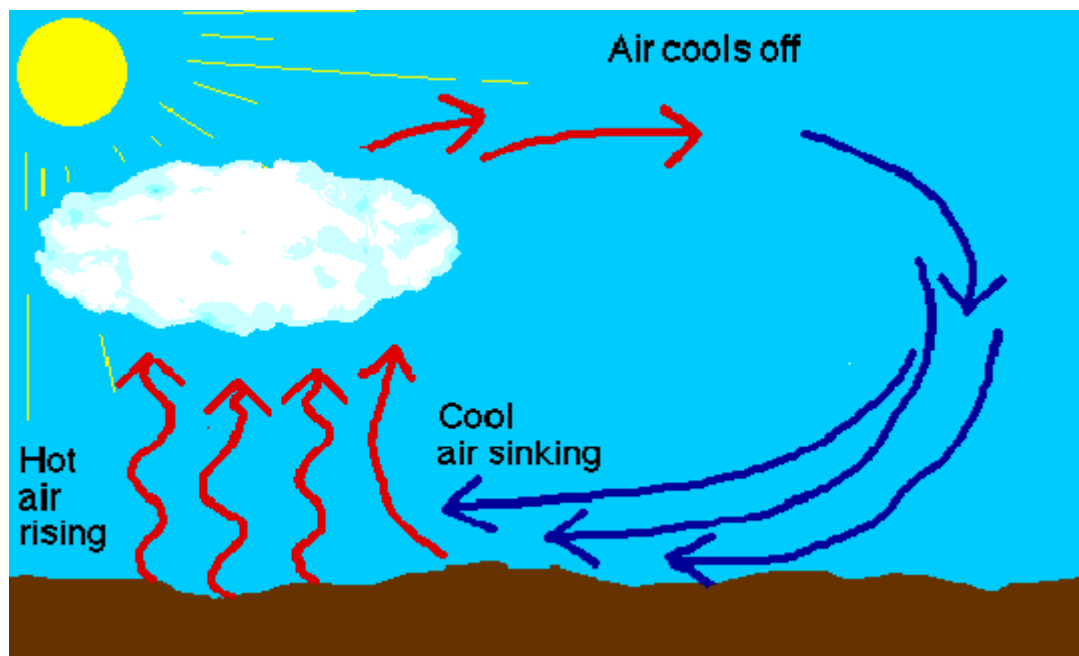
The Role of the Atmosphere in Climate Control:

Atmosphere covers the Earth, like a blanket. We know that air is a bad conductor of heat. The atmosphere keeps the average temperature of the Earth fairly steady during the day and even during the course of the whole year. The atmosphere prevents the sudden increase in temperature during the daylight hours. And during the night, it slows down the escape of heat into outer space. The moon, which is about the same distance from the Sun that the Earth is, with no atmosphere, the temperature ranges from $-190^{\circ}C$ to $110^{\circ}C$.



THE MOVEMENT OF AIR: WINDS

These phenomena are the result of changes that take place in our atmosphere due to the heating of air and the formation of water vapour. Water vapour is formed due to the heating of water bodies and the activities of living organisms. The rise in temperature creates a low pressure zone which attracts cool air from high pressure zone and pushes up the hot air. Thus the atmosphere can be heated from below by the radiation that is reflected back or re-radiated by the land or water bodies. On being heated, convection currents are set up in the air.

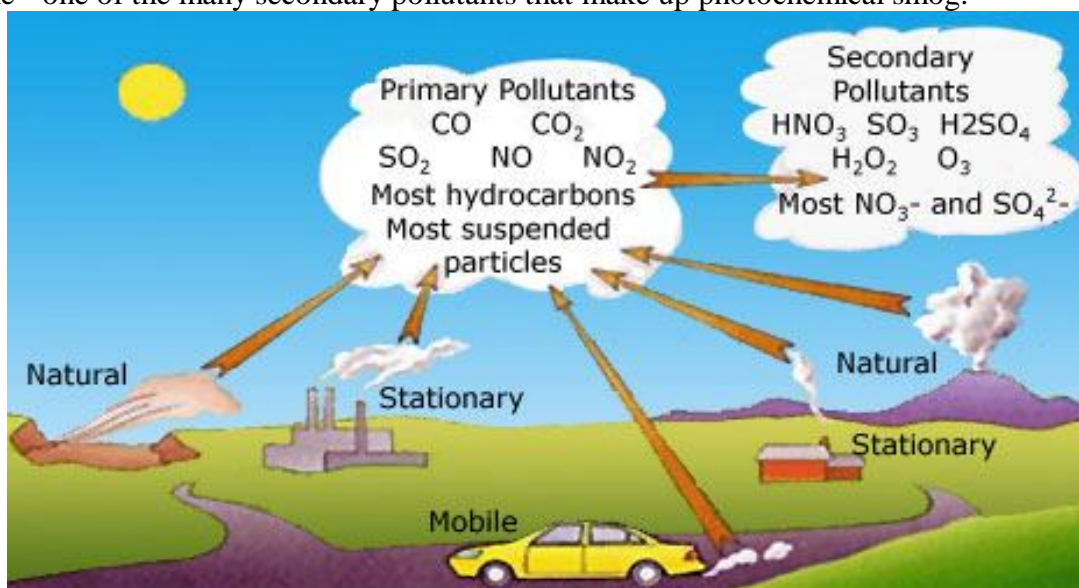


AIR POLLUTION

An air pollutant is known as a substance in the air that can cause harm to humans and the environment. Pollutants can be in the form of solid particles, liquid droplets, or gases. In addition, they may be natural or man-made.

Pollutants can be classified as either primary or secondary. Usually, primary pollutants are substances directly emitted from a process, such as ash from a volcanic eruption, the carbon monoxide gas from a motor vehicle exhaust or sulfur dioxide released from factories.

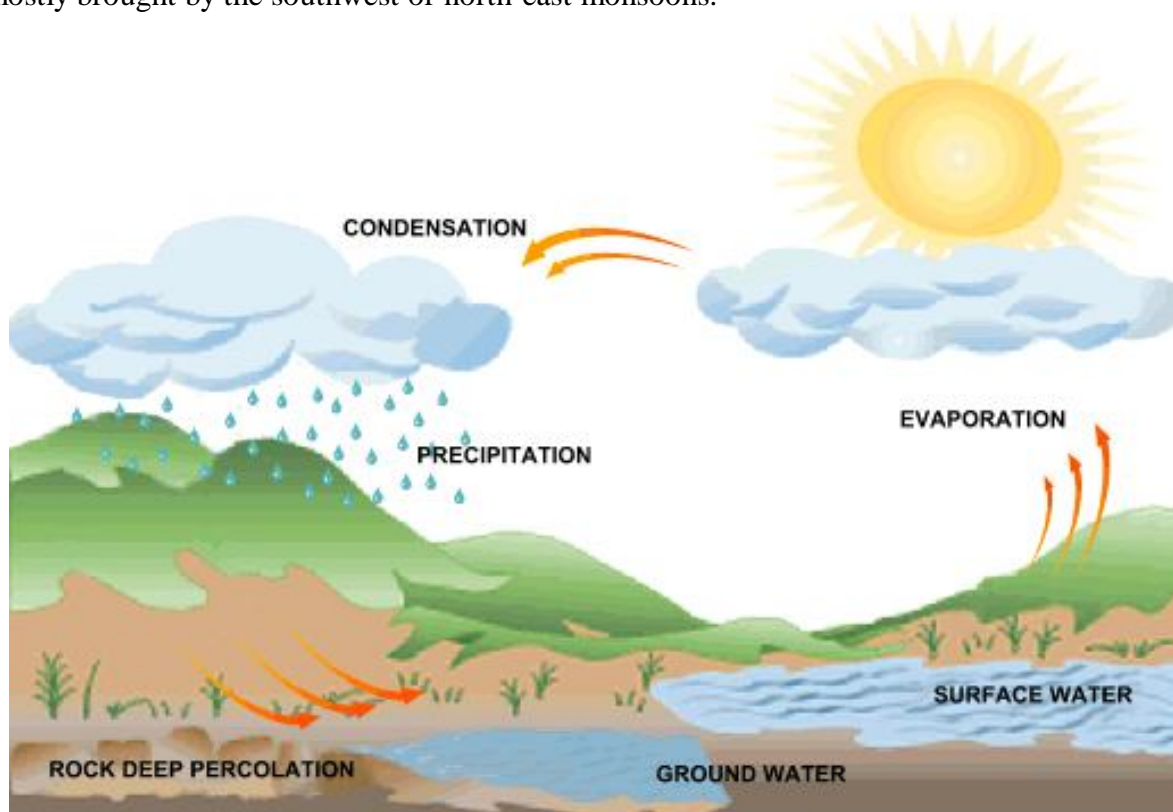
Secondary pollutants are not emitted directly. Rather, they form in the air when primary pollutants react or interact. An important example of a secondary pollutant is ground level ozone - one of the many secondary pollutants that make up photochemical smog.



RAIN

When water bodies are heated during the day, a large amount of water evaporates and goes into the air. Some amount of water vapour also gets into the atmosphere because of various biological activities. This air also gets heated. The hot air rises up carrying the water vapour with it. As the air rises, it expands and cools. This cooling causes the water vapour in the air to condense in the form of tiny droplets. This condensation of water is facilitated if some particles could act as the 'nucleus' for these drops to form around. Once the water droplets are formed, they grow bigger by the 'condensation' of these water droplets. When the drops have grown big and heavy, they fall down in the form of rain.

Rainfall patterns are decided by the prevailing wind patterns. In large parts of India, rains are mostly brought by the southwest or north-east monsoons.



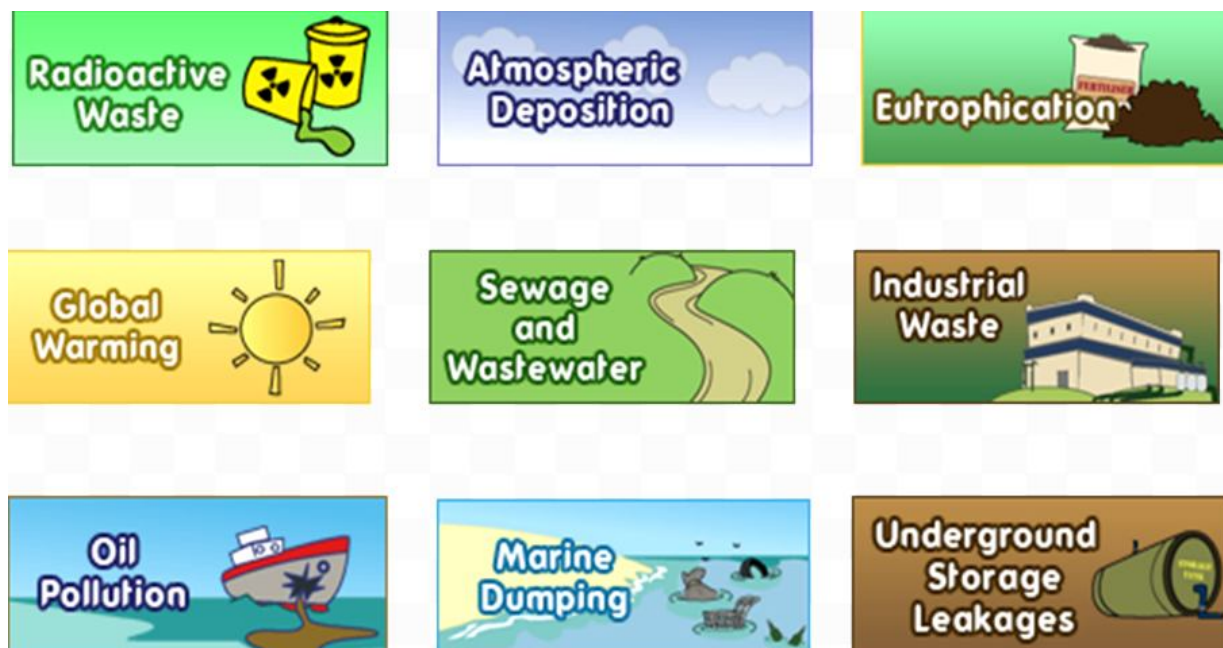
WATER: A WONDER LIQUID

Water occupies a very large area of the Earth's surface and is also found underground. Some amount of water exists in the form of water vapour in the atmosphere. Most of the water on Earth's surface is found in seas and ocean and is saline. Fresh water is found frozen in the ice-caps at the two poles and on snow covered mountains. The underground water and the water in rivers, lakes and ponds is also fresh. However, the availability of fresh water varies from place to place. Practically every summer, most places have to face a shortage of water. And in rural areas, where water supply systems have not been installed, people are forced to spend considerable amounts of time in fetching water from faraway sources.

Importance of Water: All cellular processes take place in a water medium. All the reactions that take place within our body and within the cells occur between substances that are dissolved in water. Substances are also transported from one part of the body to the other in a dissolved form. Hence, organisms need to maintain the level of water within their bodies in order to stay alive. Terrestrial life-forms require fresh water for this because their bodies cannot tolerate or get rid of the high amounts of dissolved salts in saline water. Thus, water sources need to be easily accessible for animals and plants to survive on land.

WATER POLLUTION

Water pollution is the contamination of water bodies such as lakes, rivers, ocean and groundwater caused by human activities, which can be harmful to organisms and plants that live in these water bodies. Some of the causes of water pollution are shown in below figure:



We use the term water-pollution to cover the following effects:

1. The addition of undesirable substances to water-bodies. These substances could be the fertilizers and pesticides used in farming or they could be poisonous substances, like mercury salts which are used by paper-industries. These could also be disease-causing organisms, like the bacteria which cause cholera.
2. The removal of desirable substances from water-bodies. Dissolved oxygen is used by the animals and plants that live in water. Any change that reduces the amount of this dissolved oxygen would adversely affect these aquatic organisms. Other nutrients could also be depleted from the water bodies.
3. A change in temperature. Aquatic organisms are used to a certain range of temperature in the water-body where they live, and a sudden marked change in this temperature would be dangerous for them or affect their breeding. The eggs and larvae of various animals are particularly susceptible to temperature changes.

SOIL

Soil is an important resource that decides the diversity of life in an area. The outermost layer of our Earth is called the crust and the minerals found in this layer supply a variety of nutrients to life-forms.

The factors or processes that make soil:

- **The Sun:** The Sun heats up rocks during the day so that they expand. At night, these rocks cool down and contract. Since all parts of the rock do not expand and contract at the same rate, this results in the formation of cracks and ultimately the huge rocks break up into smaller pieces.
- **Water:** Water helps in the formation of soil in two ways. One, water could get into the cracks in the rocks formed due to uneven heating by the Sun. If this water later freezes, it would cause the cracks to widen. Two, flowing water wears away even hard rock over long periods of time. Fast flowing water often carries big and small particles of rock downstream. These rocks rub against other rocks and the resultant abrasion causes the rocks to wear down into smaller and

smaller particles. The water then takes these particles along with it and deposits it further down its path. Soil is thus found in places far away from its parent rock.

- **Wind:** In a process similar to the way in which water rubs against rocks and wears them down, strong winds also erode rocks down. The wind also carries sand from one place to the other like water does.

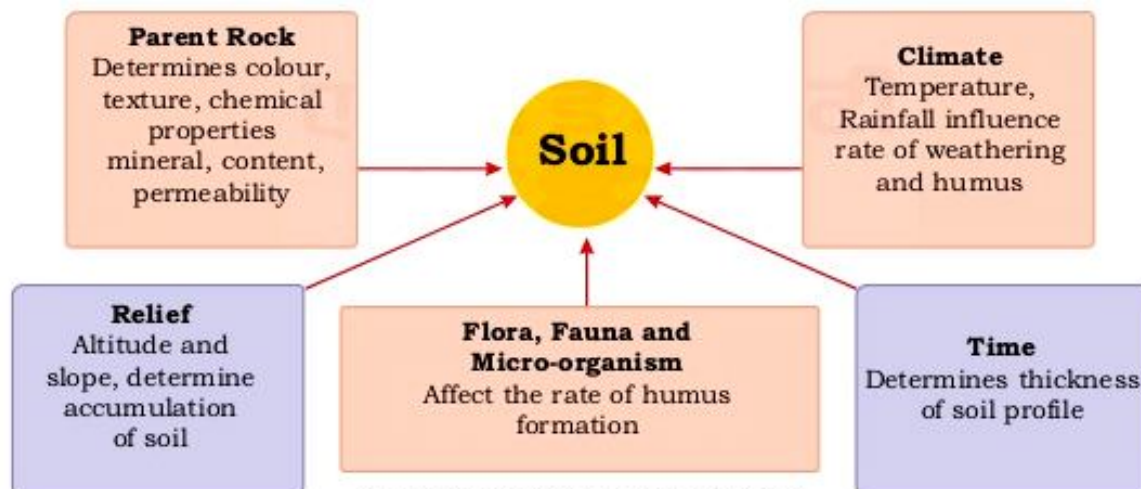


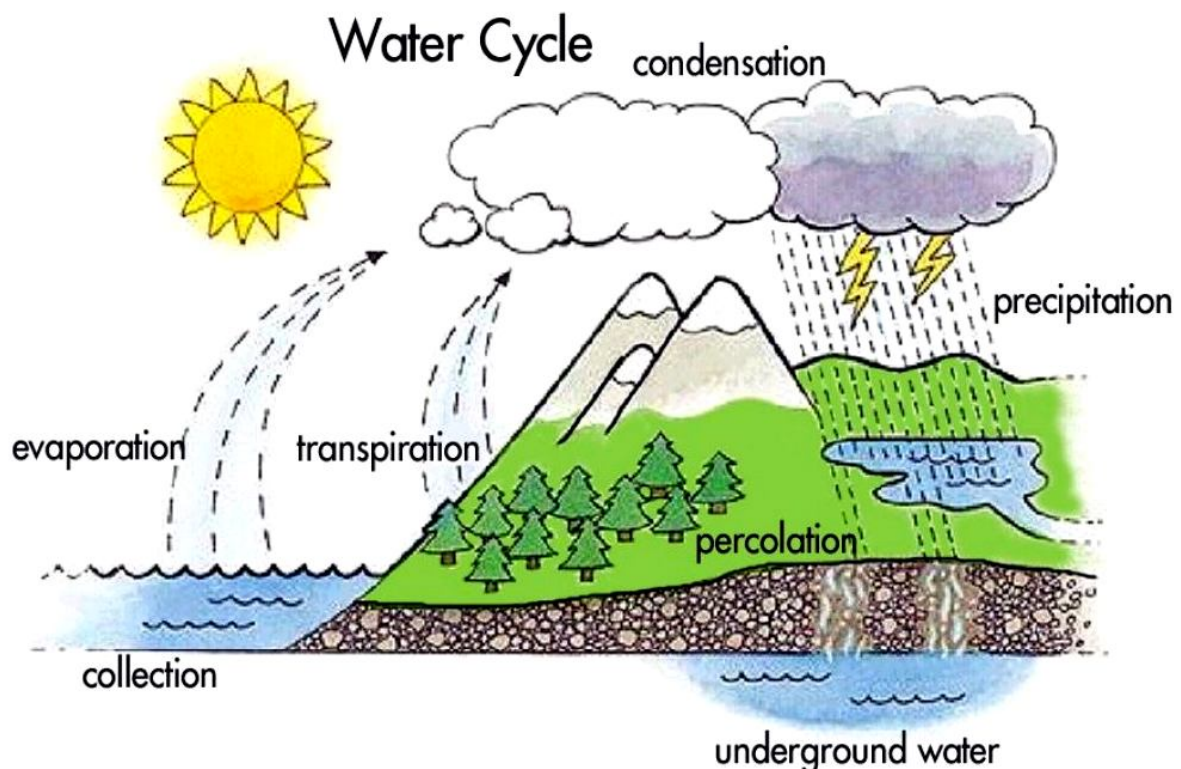
Fig. Factors affecting soil formation

BIOGEOCHEMICAL CYCLES

A constant interaction between the biotic and abiotic components of the biosphere makes it a dynamic, but stable system. These interactions consist of a transfer of matter and energy between the different components of the biosphere.

THE WATER-CYCLE

The water cycle, also known as the hydrologic cycle, describes the continuous movement of water on, above, and below the surface of the earth.



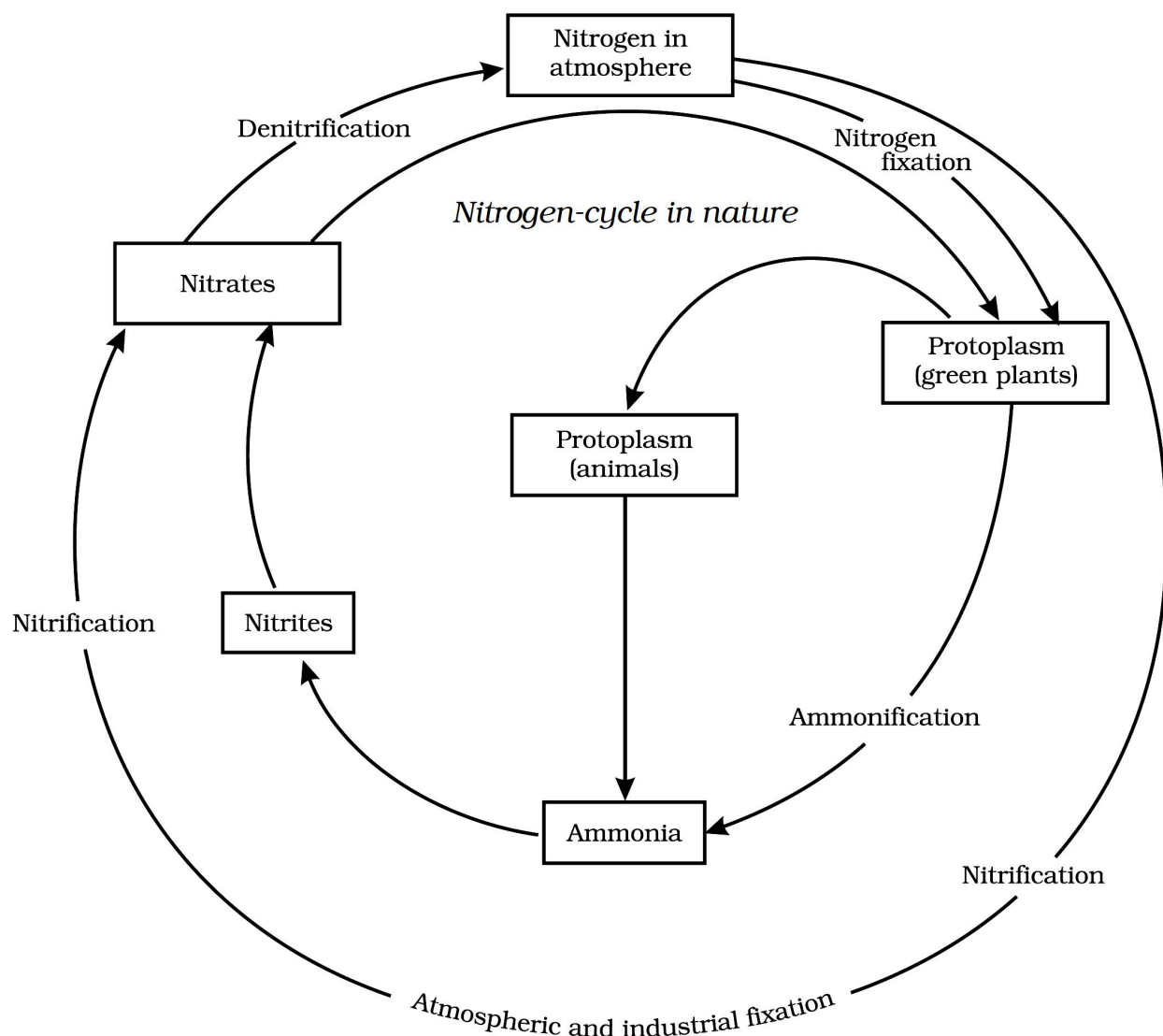
Water can change states among liquid, vapour and ice at various places in the water cycle. Although the balance of water on Earth remains fairly constant over time, individual

water molecules can come and go. The sun, which drives the water cycle, heats water in the oceans. Water evaporates as vapor into the air. Ice and snow can sublime directly into water vapor. Rising air currents take the vapor up into the atmosphere where cooler temperatures cause it to condense into clouds. Air currents move clouds around the globe, cloud particles collide, grow, and fall out of the sky as precipitation. Some precipitation falls as snow and can accumulate as ice caps and glaciers, which can store frozen water for thousands of years. Snow packs can thaw and melt, and the melted water flows overland as snowmelt. Most precipitation falls back into the oceans or onto land, where the precipitation flows over the ground as surface runoff. A portion of runoff enters rivers in valleys in the landscape, with stream flow moving water towards the oceans. Runoff and groundwater, are stored as freshwater in lakes.

Not all runoff flows into rivers. Much of it soaks into the ground as infiltration. Some water infiltrates deep into the ground and replenishes aquifers, which store huge amounts of freshwater for long periods of time. Some infiltration stays close to the land surface and can seep back into surface-water bodies (and the ocean) as groundwater discharge. Some groundwater finds openings in the land surface and emerges as freshwater springs. Over time, the water reenters the ocean, where our water cycle started.

THE NITROGEN-CYCLE

The nitrogen cycle is the biogeochemical cycle that describes the transformations of nitrogen and nitrogen-containing compounds in nature. It is a cycle which includes gaseous components.



Earth's atmosphere is about 78% nitrogen, making it the largest pool of nitrogen. Nitrogen is essential for many biological processes; it is crucial for any life here on Earth. It is in all amino acids, is incorporated into proteins, and is present in the bases that make up nucleic acids, such as DNA and RNA. In plants, much of the nitrogen is used in chlorophyll molecules which are essential for photosynthesis and further growth.

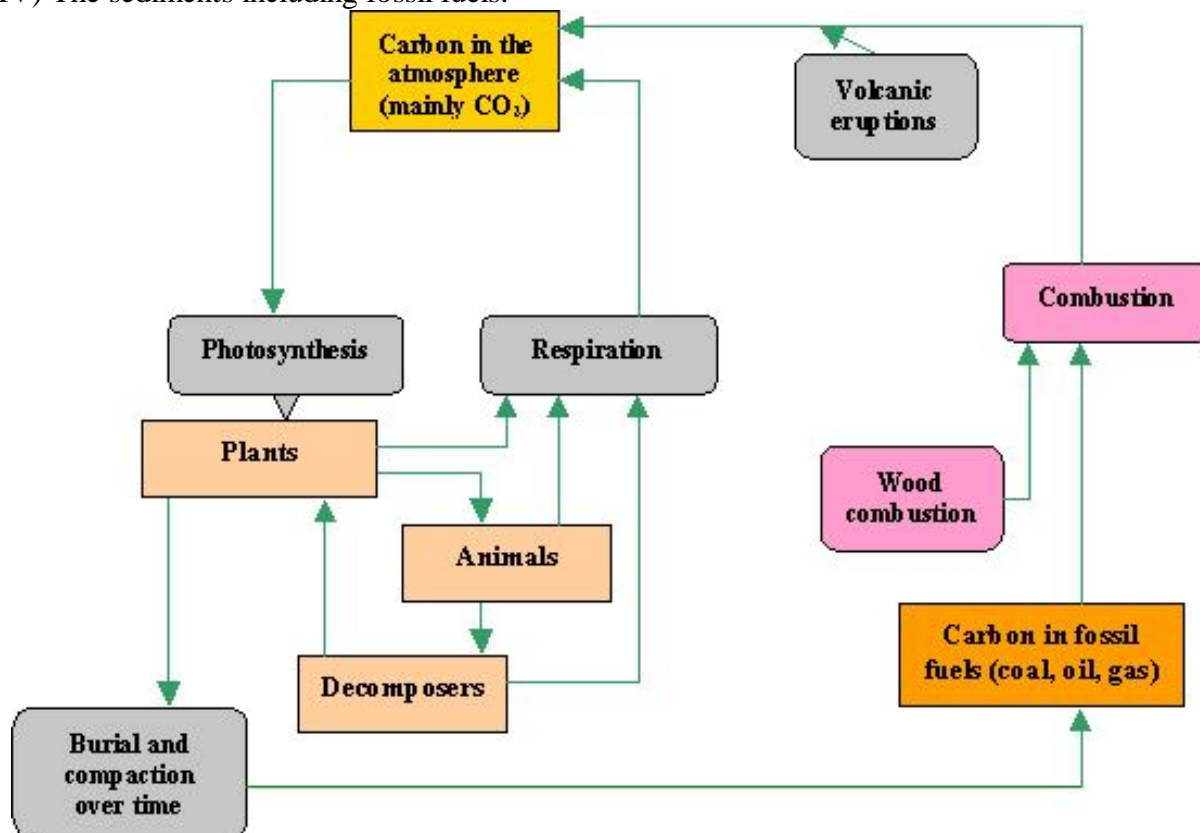
Processing, or fixation, is necessary to convert gaseous nitrogen into forms usable by living organisms. Some fixation occurs in lightning strikes, but most fixation is done by free-living or symbiotic bacteria. These bacteria have the nitrogenase enzyme that combines gaseous nitrogen with hydrogen to produce ammonia, which is then further converted by the bacteria to make its own organic compounds. Some nitrogen fixing bacteria, such as *Rhizobium*, live in the root nodules of legumes (such as peas or beans). Here they form a mutualistic relationship with the plant, producing ammonia in exchange for carbohydrates. Nutrient-poor soils can be planted with legumes to enrich them with nitrogen. A few other plants can form such symbioses. Nowadays, a very considerable portion of nitrogen is fixated in ammonia chemical plants.

THE CARBON-CYCLE

The carbon cycle is the biogeochemical cycle by which carbon is exchanged among the biosphere, pedosphere, geosphere, hydrosphere, and atmosphere of the Earth.

The cycle is usually thought of as four major reservoirs of carbon interconnected by pathways of exchange. These reservoirs are:

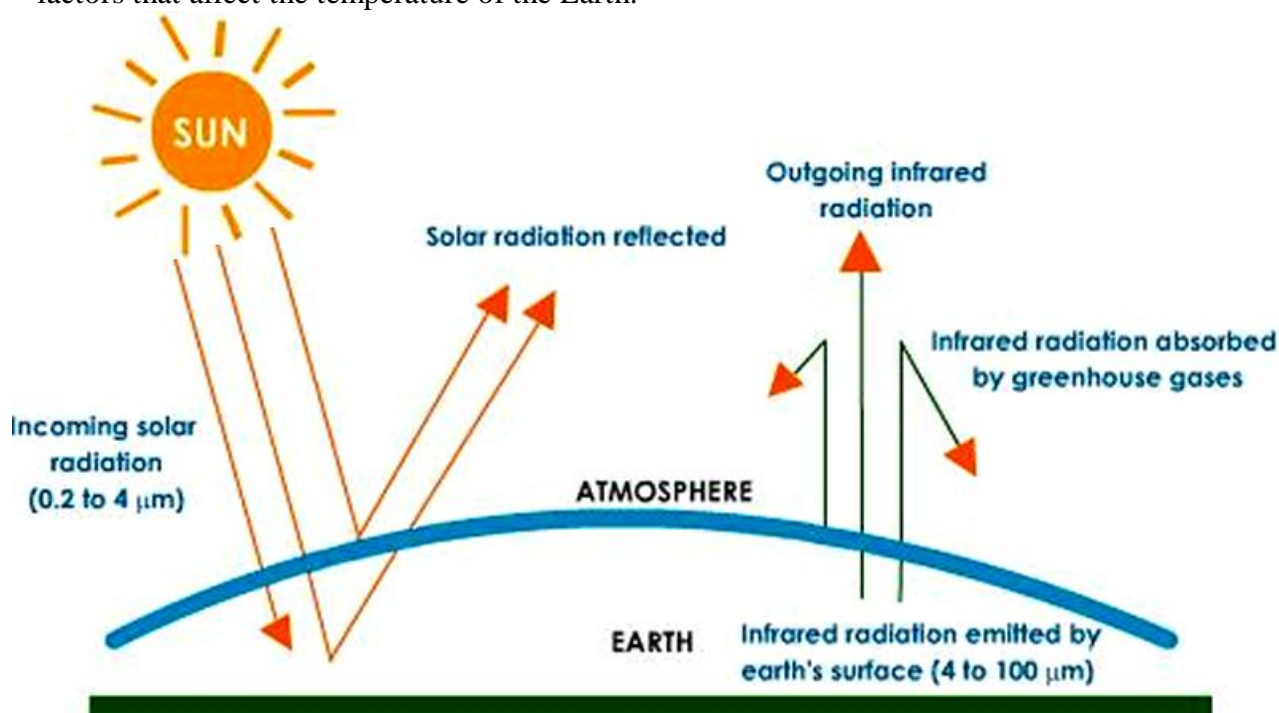
- (I) The atmosphere.
- (II) The terrestrial biosphere, which is usually defined to include fresh water systems and non-living organic material, such as soil carbon.
- (III) The oceans, including dissolved inorganic carbon and living and non-living marine biota,
- (IV) The sediments including fossil fuels.



THE GREENHOUSE EFFECT

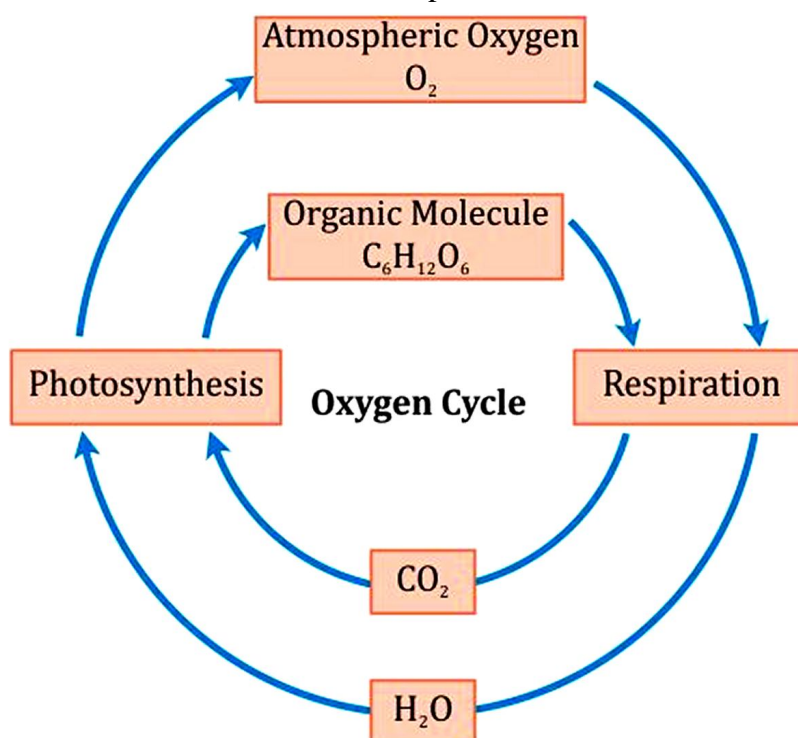
The greenhouse effect refers to the change in the steady state temperature of a planet or moon by the presence of an atmosphere containing gas that absorbs and emits infrared

radiation. Greenhouse gases, which include water vapor, carbon dioxide and methane, warm the atmosphere by efficiently absorbing thermal infrared radiation emitted by the earth's surface, by the atmosphere itself, and by clouds. As a result of its warmth, the atmosphere also radiates thermal infrared in all directions, including downward to the Earth's surface. Thus, greenhouse gases trap heat within the surface-troposphere system. The greenhouse effect is one of several factors that affect the temperature of the Earth.



THE OXYGEN-CYCLE

The oxygen cycle is the biogeochemical cycle that describes the movement of oxygen within and between its three main reservoirs: the atmosphere (air), the biosphere (living things), and the lithosphere (earth's crust). The main driving factor of the oxygen cycle is photosynthesis, which is responsible for the modern Earth's atmosphere and life.



Energy Cycle

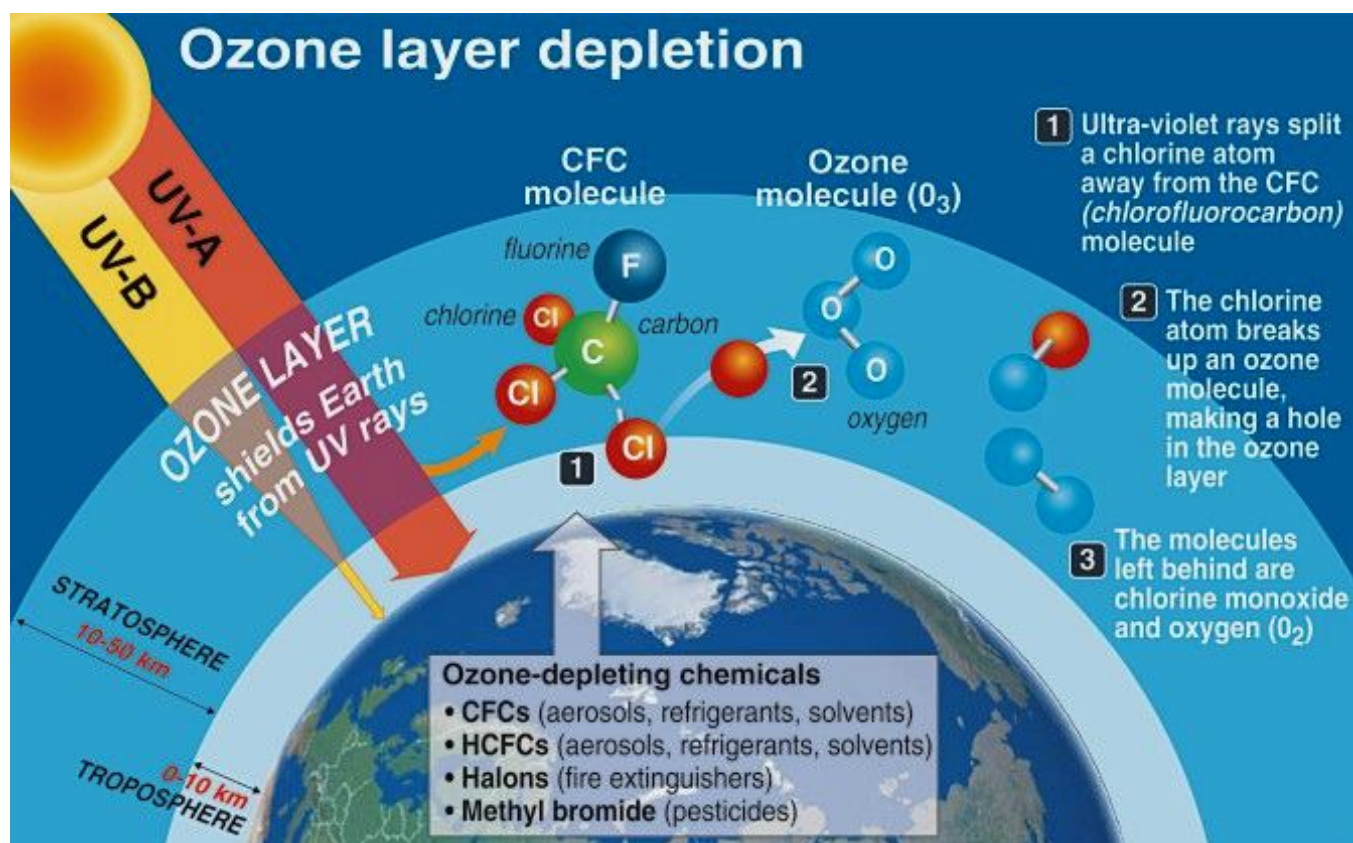
All the above mentioned cycle can be grouped or explained as energy cycle on this earth. In fact sun is the main source of energy for every activity on earth. This energy facilitates the everlasting cycle of all resources in the biosphere. This system ensures that whatever we take from earth and its atmosphere we return it in some way or other. A living organism is made of Carbon, Oxygen, Nitrogen and other elements. All living organisms need regular dose of these elements to continue life. During lifetime all these things are returned to the atmosphere in some way. For example we return oxygen in the form of carbon dioxide and return water in the form of sweat or urine.

Ultimately when a living being dies, then the body gets decomposed by decomposers, like bacteria. These decompose the body into basic elements out of which it was originally made. That is how the everlasting cycle of life goes on.

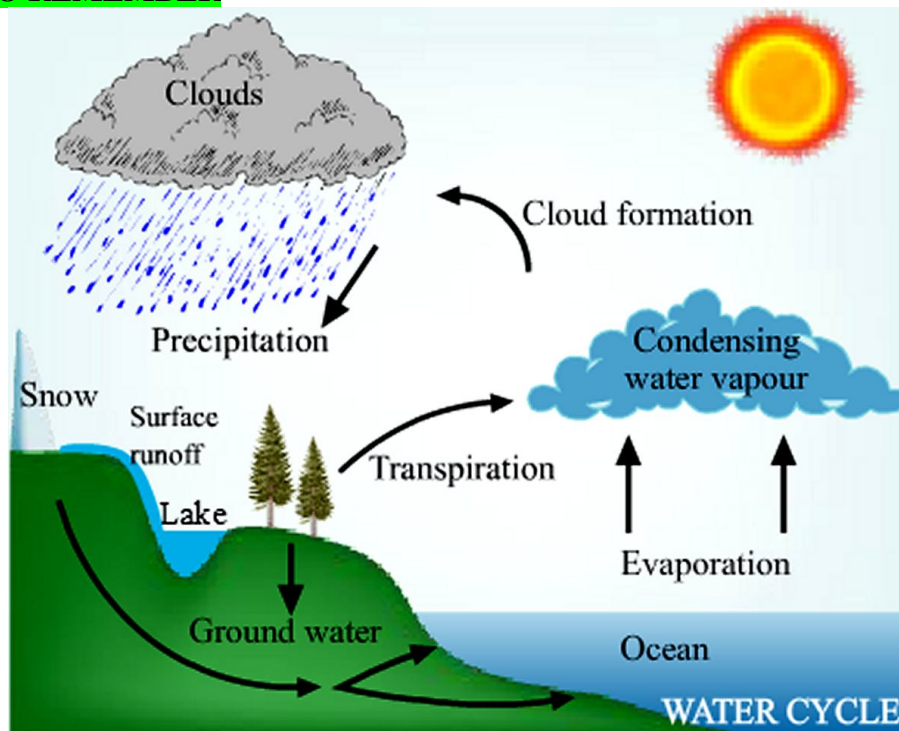
OZONE LAYER

The ozone layer is a layer in earth's atmosphere which contains relatively high concentrations of ozone. This layer absorbs 93-99% of the sun's high frequency ultraviolet light, which is potentially damaging to life on earth. Over 91% of the ozone in Earth's atmosphere is present here. It is mainly located in the lower portion of the stratosphere from approximately 10 km to 50 km above Earth's surface, though the thickness varies seasonally and geographically.

Because of heavy use of CFCs (Chlorofluorocarbons) in refrigerators and pressurized cans by human the ozone layer has broken at some places. This has caused an alarming rise in ultraviolet radiation leading to increased cases of skin cancers.

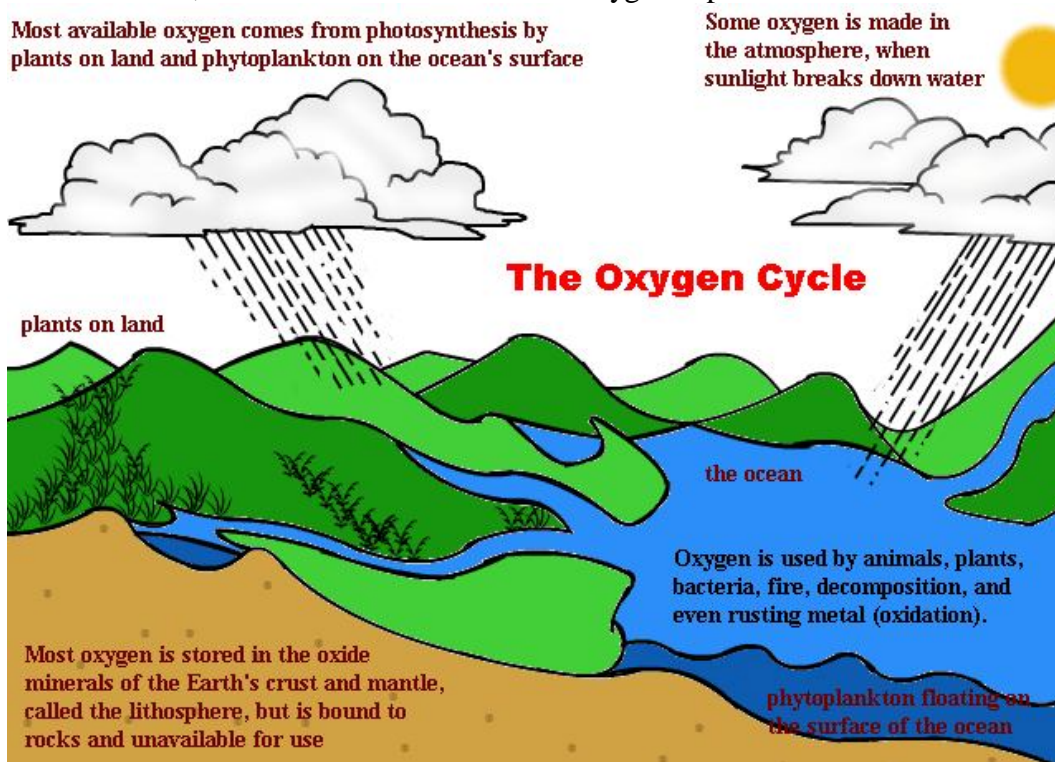


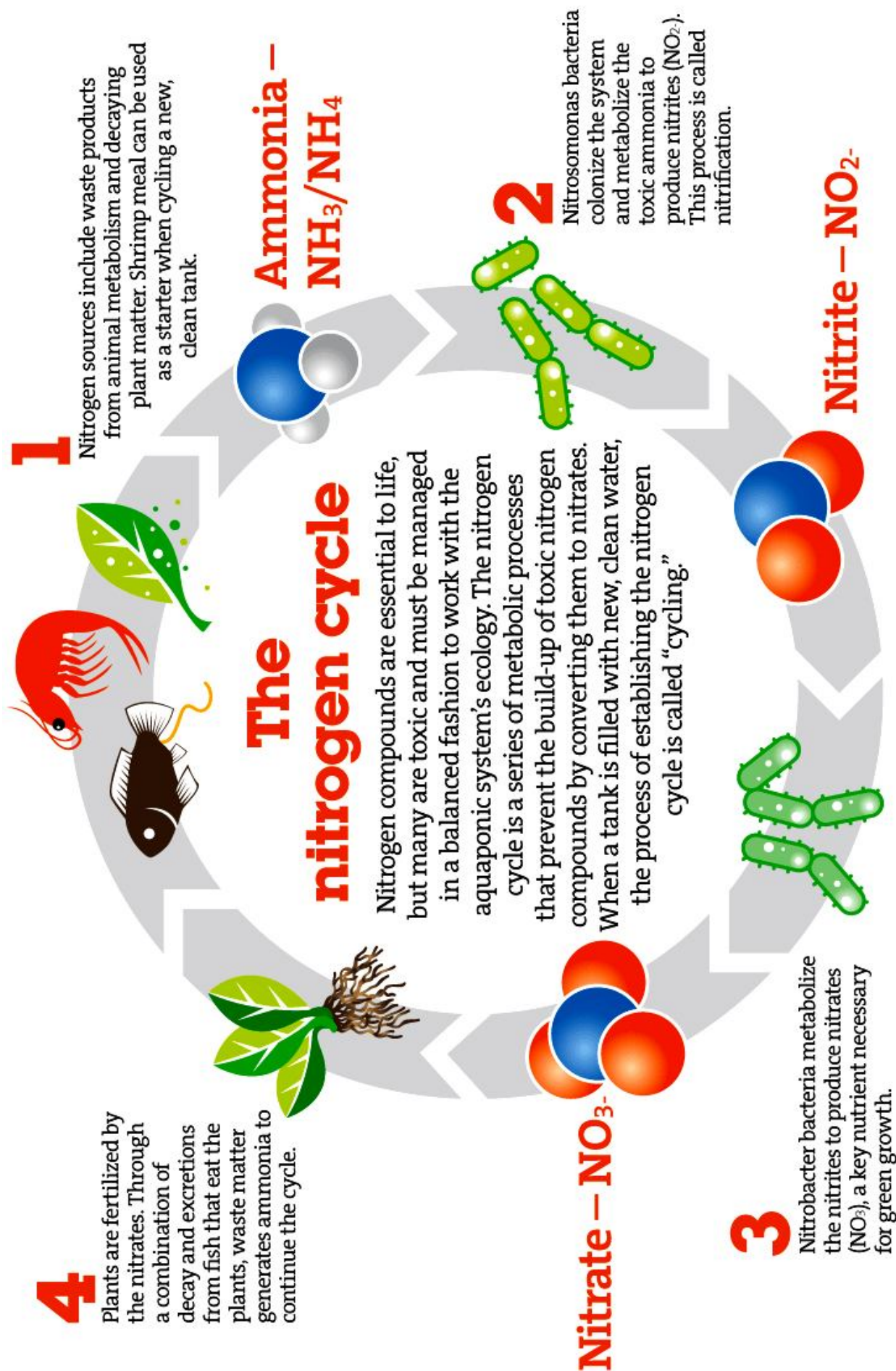
POINTS TO REMEMBER



OXYGEN CYCLE

- The oxygen in the atmosphere is freed by the process of photolysis. The energy in the sunlight breaks the oxygen bearing oxygen to produce free oxygen. Oxygen molecule is broken down by UV rays from the sun. This cycle shields earth from harmful UV rays.
- In the biosphere, oxygen undergoes cycles of respiration and photosynthesis. Humans and animals breathe in oxygen. This oxygen is used in metabolic processes and carbon dioxide given out. Plants and phytoplanktons undergo process of photosynthesis where carbon dioxide is used in the presence of sunlight to form carbohydrates and oxygen.
- In the lithosphere, oxygen is fixed in minerals like silicates and oxides. Oxygen from these minerals is freed by chemical weathering. When the mineral bearing oxygen is exposed to chemical reaction, the mineral wears down free oxygen is produced.





INTEXT QUESTIONS PAGE NO. 193

Q1. How is our atmosphere different from the atmosphere on Venus and Mars?

Answer: The atmosphere of Earth contains a mixture of many gases like nitrogen (78.08%), oxygen (20.95%), carbon dioxide (0.03%) and water vapour (in varying proportion). On the other hand, the atmosphere on Venus and Mars mainly contains carbon dioxide, *i.e.*, about 95-97%. It may be the reason that due to this, no life is known to exist in both Venus and Mars.

Q2. How does the atmosphere act as a blanket?

Answer: The atmosphere mainly contains air which is a bad conductor of heat. Due to this, the atmosphere keeps the average temperature of the Earth fairly balanced during the day and even throughout the year. The atmosphere prevents the sudden increase in temperature during the daylight hours and during the night, it slows down the escape of heat into the outer space. In this way, atmosphere acts as a blanket.

Q3. What causes winds?

Answer: Winds occur due to unequal heating of atmospheric air. The heat causes rising up of air along with water vapour. As the air rises, it expands and cools. This cooling causes the water vapour in the air to condense. The condensation of water occurs if some particles (like dust particles) act as the 'nucleus' for these drops to stick around. These tiny droplets grow bigger by more and more condensation of other water droplets and finally form the clouds.

Q4. How are clouds formed?

Answer: Water evaporates from water bodies and goes into the atmosphere. Air also becomes hot due to sunlight and starts rising up taking along with water vapour. As the air rises up, it expands and cools. This cooling of air causes water vapour in the air to condense. The process of condensation of water occurs, if some particles (like dust) act as the 'nucleus' for these drops to form around. None these small droplets grow and become big by more and more condensation of other droplets of water. These steps form the clouds.

Q5. List any three human activities that you think would lead to air pollution.

Answer: The following activities lead to air pollution:

- (i) Excessive burning of fossil fuels, *i.e.*, coal and petroleum produces high amount of oxides of nitrogen and sulphur. These oxides mix with air and cause acid rain leading to many harmful effects.
- (ii) Many industries release high amount of poisonous gases into the atmosphere causing air pollution.
- (iii) Forest fires, excessive use of chlorofluorocarbons (CFCs) used in refrigerators, excessive mining and ore refining release harmful gases into the air leading to pollution.

INTEXT QUESTIONS PAGE NO. 194

Q1. Why do organisms need water?

Answer: Organisms need water because:

- (i) Cellular processes need water for their functioning.
- (ii) Substances dissolve in water for reactions to take place within the cells.
- (iii) Transportation of substances within the body need water.
- (iv) Water helps in digestion of food and its absorption in the blood.
- (v) It helps to maintain body temperature.

Q2. What is the major source of freshwater in the city/town/village where you live?

Answer: In city/town/village, the major source of water is underground water. It is drawn with the help of hand pumps and tube-wells. The other nearby sources are rivers, lakes and ponds.

Q3. Do you know of any activity which may be polluting this water source?

Answer: The activities which may be polluting the water bodies are:

- (i) Disposal of garbage or sewage from cities/towns and from factories.
- (ii) Hot water may be released from the industries which may disturb the temperature of water body leading to death of many aquatic organisms.

INTEXT QUESTIONS PAGE NO. 196

Q1. How is soil formed?

Answer: The formation of soil takes place in the following ways:

- (i) Rocks near the surface of Earth are broken down by various physical, chemical and some biological processes. This process takes millions of years.
- (ii) This weathering leads to the formation of fine particles called soil.
- (iii) Some other factors also lead to the formation of soil. These are:
 - (a) Sun causes heating of rocks that causes cracking and breaks down them into small particles.
 - (b) Water dissolve rocks by freezing and fast flowing.
 - (c) Wind causes erosion of rocks by fast blowing.
 - (d) Liches and mosses grow on rock surfaces and break them into powder down and form a thin layer of soil. The big trees sometimes enter into cracks in the rocks and force them to break further during their growth.

Q2. What is soil erosion?

Answer: Soil erosion is the process of removal of top soil. It is rich in humus and nutrients. The agents of soil erosion are mainly flowing water or wind. If soil erosion is continued for a long time, the land becomes infertile and barren due to the loss of its valuable nutrients.

Q3. What are the methods of preventing or reducing soil erosion?

Answer: Preventive methods of soil erosion

- (i) **Afforestation** Planting more trees reduces soil erosion.
- (ii) **Contour Ploughing** Ploughing land in furrows across the natural slope of the land helps trap water and prevent the washing away of top soil along with it.
- (iii) **Step (terrace) Farming** Farmers form a series of steps by making horizontal strips supported by walls to catch the descending water. It gives the water sufficients time to percolate into the soil and nourish the crop.
- (iv) **Soil Cover** After harvesting a crop, soil is covered with dried vegetation to prevent its erosion.
- (v) **Overgrazing** Grasses tend to bind soil particles to prevent their erosion. If overgrazing is allowed, the grasses are uprooted and soil gets eroded.

INTEXT QUESTIONS PAGE NO. 201

Q1. What are the different states in which water is found during the water cycle?

Answer: Water can be seen in water cycle in its all three different states.

These are:

- (i) **Gaseous State** It occurs in the form of water vapour. It evaporates from the surface of water bodies and mixes with air.
- (ii) **Liquid State** Water vapour condense high up in the atmosphere. It falls on the Earth in the form of rain.
- (iii) **Solid State** It is formed by the freezing of liquid droplets in the upper layer of atmosphere. These droplets fall on the Earth in the form of snow, hail or sleet.

Q2. Name two biologically important compounds that contain both oxygen and nitrogen.

Answer: The biologically important compounds that contain both oxygen and nitrogen are nitrates (NO_2^-) and nitrites (NO_3^-). These are important forms of nitrogen to be utilized by the plants to synthesize biomolecules like proteins.

Q3. List any three human activities which would lead to an increase in the carbon dioxide content of air.

Answer: The human activities which would lead to an increase in CO_2 content of air are:

- (i) **Respiration** is the natural way to release of CO_2 by both plants and animals. It is balanced by the release of oxygen by plants. So, it is not harmful for the environment.
- (ii) **Deforestation** increases the level of CO_2 in the environment. Trees carry out photosynthesis and convert CO_2 into organic compounds such as glucose, starch, etc. In their absence, CO_2 cannot be utilized.
- (iii) **Combustion of fuels** leads to increase in CO level in the atmosphere. Fuels are burnt to carryout activities like cooking, transportation and in industrial processes.

Q4. What is the greenhouse effect?

Answer: Some gases called greenhouse gases, e.g., CO_2 prevent the escape of heat from the Earth. When the amount of such gases increases more than their normal levels, the average temperature of the Earth increases. This is called greenhouse effect.

Q5. What are the two forms of oxygen found in the atmosphere?

Answer: The two forms of oxygen found in the atmosphere are:

- (i) Elemental oxygen is normally found in the form of diatomic molecule (O_2) in the lower part of atmosphere. It is about 21% in the air and non-poisonous.
- (ii) Ozone is found in the stratosphere part of atmosphere. It contains three atoms of oxygen (O_3). It is the poisonous form of oxygen.
- (iii) Some other forms of oxygen are also found in the combined state. In Earth's crust, it is found as the oxides of most metals and silicon and also as carbonate, sulphate, nitrate and other minerals. In other forms, it is the part of biological molecules like carbohydrates, proteins, fats and nucleic acids, etc.

EXERCISE QUESTIONS PAGE NO. 201, 202

Q1. Why is the atmosphere essential for life?

Answer: Atmosphere is important for life due to following reasons:

- (i) It keeps the average temperature of the Earth steady during the day and even throughout the year.
- (ii) It prevents the sudden increases in temperature during the daylight hours.
- (iii) The gases it contains are required for sustaining life on Earth. These gases are:
 - (a) Oxygen which is required for respiration by all living organisms.
 - (b) Carbon dioxide is used in photosynthesis by plants to synthesize food.
 - (c) Nitrogen provides inert atmosphere and an important components of proteins.
- (iv) A thick layer of ozone (in stratosphere) of atmosphere, filters the harmful UV radiations reaching the Earth. The UV rays produce harmful effects on all living organisms.

Q2. Why is water essential for life?

Answer: Water is essential for life because of these reasons:

- (i) It provides medium to carryout all the cellular processes.
- (ii) All the reactions that occur in our body and within cells occur between substances that are dissolved in water
- (iii) It is required for the transportation of materials from one part of the body to the other.
- (iv) It helps to maintain body temperature.
- (v) Water makes up about 70% of body weight of all the living organisms.

Q3. How are living organisms dependent on soil? Are organisms that live in water totally independent of soil as a resource?

Answer: Living organisms depend on soil in the following ways:

- (i) It provides natural habitat for various living organisms, *e.g.*, bacteria, fungi, algae, earthworms, etc. These help to maintain the fertility of soil.
- (ii) Earthworm performs all its activities in the soil. It maintains the fertility of soil by releasing nitrogen rich excreta.
- (iii) Many animals like rats, rabbits, etc., make their home in the soil.
- (iv) Soil helps to bind the roots of plants to provide them anchorage. The nutrients in soil are absorbed by the plants for their growth and development.

All organisms that live in water are totally dependent on soil because the mineral nutrients are present in water in the dissolved form. But, their recycling depends on the decomposers which are present in soil beds. For this, all water bodies have soil beds which contain decomposers for the recycling of nutrients.

Q4. You have seen weather reports on television and in newspapers. How, do you think we are able to predict the weather?

Answer: Meteorologists collect information regarding the pattern of temperature, speed of wind, air pressure and all other features which influence weather. All these information are collected by remote sensing and weather forecast satellites. This information is then compiled in meteorological departments which prepare a weather report that is displayed on the maps. This information is further transmitted through radio, television and newspaper.

Q5. We know that many human activities lead to increasing levels of pollution of the air, water-bodies and soil. Do you think that isolating these activities to specific and limited areas would help in reducing pollution?

Answer: Isolating human activities to specific and limited areas would definitely help in reducing pollution to some extent. For example,

- (i) If sewage and garbage generated by homes and industries is treated properly before discharging into water sources, it will reduce water pollution and cause less harm to the aquatic life.
- (ii) If hot water generated by the industries is collected at common place, allowed to cool and then discharged in water bodies, will not affect the breeding capacity of aquatic organisms.
- (iii) If commercial areas, factories and industries are shifted to the isolated area far away from residential areas, it can reduce the effect of air pollution on people.

Q6. Write a note on how forests influence the quality of our air, soil and water resources.

Answer: Forests influence the quality of air, soil and water resources in following ways:

- (i) Influence of forests on air occurs in these ways:
 - (a) Forests help to maintain oxygen and carbon dioxide balance in the air. They reduce the level of CO₂ in the air and to prevent greenhouse effect.
 - (b) These maintain temperature of the environment.
 - (c) Forests increase the rate of photosynthesis in surrounding region.
- (ii) Influence of forests in quality of soil:
 - (a) Trees spread their roots deep inside the Earth and bind the soil particles firmly. This reduces soil erosion.
 - (b) Forests help to maintain nutrient cycles (biogeochemical cycles) in the atmosphere.
- (iii) Influence of forests in quality of water:
 - (a) Trees help to maintain water cycle.
 - (b) Forests conserve water and make them available on the surface of Earth as water sources.

ASSIGNMENT QUESTIONS SET – 1
CHAPTER – 14
NATURAL RESOURCES

1. Hot air is _____ than cold air.
2. Green plants convert carbon dioxide into glucose in the presence of _____.
3. The life-supporting zone of the Earth where the atmosphere, the hydrosphere and the lithosphere interact and make life possible, is known as the _____.
4. The space among the soil particles are filled with _____.
5. Dead remains of plants and animals is called _____.
6. Water covers _____% of the Earth's surface.
7. On planets like Venus and Mars the major component of the atmosphere is _____.
8. The fossil fuels like coal and petroleum contain small amounts of _____ and _____ which are primarily responsible for acid rain.
9. The substances that cause pollution are called _____.
10. _____ is the region of atmosphere where ozone layer is present.
11. _____ is formed due to condensation of water vapours in the lower region of atmosphere.
12. _____ is a major factor in deciding the soil structure because it causes the soil to become more porous and allows water and air to penetrate deep underground.
13. Ozone hole was first detected over _____.
14. The eggs and larvae of various aquatic animals are particularly susceptible to _____ changes.
15. Corbett National Park is famous for?
 - (a) Neel Gai
 - (b) Snakes
 - (c) Rhinoceros
 - (d) Tigers
16. Green plants of an ecosystem are called.
 - (a) Producers
 - (b) Decomposers
 - (c) Consumers
 - (d) None of these
17. Energy flow in the ecosystem is
 - (a) unidirectional
 - (b) bidirectional

- (c) multidirectional
 - (d) none of these
- 18.** Two important groups of detritivores are
- (a) Animals and Plants
 - (b) Prokaryotes and Algae
 - (c) Prokaryotes and Fungi
 - (d) Plantae and Prokaryotes
- 19.** Which of the following is a nonrenewable energy source?
- (a) natural gas
 - (b) solar energy
 - (c) wind energy
 - (d) tidal energy
- 20.** Which of the following organisms is incorrectly paired with its trophic level?
- (a) cyanobacteria - primary producer
 - (b) honey bee - primary consumer
 - (c) zooplankton - primary producer
 - (d) eagle - tertiary consumer
- 21.** Where do terracing help the most in soil conservation?
- (a) Hill regions
 - (b) Wet areas
 - (c) Deserts
 - (d) Plains
- 22.** Which trophic level is considered to be the most vulnerable to extinction?
- (a) producer level
 - (b) primary consumer level
 - (c) secondary consumer level
 - (d) tertiary consumer level
- 23.** In which sphere of the environment Ozone layer is located?
- (a) Troposphere
 - (b) Stratosphere
 - (c) Mesosphere
 - (d) Thermosphere
- 24.** Solar radiations heat up:
- (a) Land faster than the water bodies
 - (b) Land slower than the water bodies
 - (c) Equally both land and water bodies
 - (d) Neither land nor water bodies

25. What is lithosphere?
26. What is hydrosphere?
27. What is atmosphere?
28. List the four zones of the atmosphere.
29. What is biosphere?
30. How is our atmosphere different from the atmosphere on Venus and Mars?
31. How does the atmosphere act as a blanket?
32. What causes winds?
33. How are clouds formed?
34. Which gets heated faster land or water?
35. Define air-pollution? (Short Answer Q)
36. List any three human activities that you think would lead to air pollution.
37. Name two diseases caused due to an increased content of pollutants in the air produced due to the burning of fossil fuels.
38. What is smog?
39. How do fossil fuel cause air pollution?
40. Meenakshi saw reduction in greenish layer of lichens at the bark of trees at the biology garden of the school. The garden was few metres away from diesel generator placed for electricity backup. She immediately informed the school authorities to check the pollution level of diesel and kerosene used in the generator. (a) How reduction in Lichens layer is related to pollution?(b) What measures should be taken by school authorities to check the reduction?(c) What qualities are shown by Meenakshi by informing school about the Lichens?
41. Give an example of fungi which are known as 'indicator of air pollution'.
42. Why do organisms need water?
43. Water is known as 'A Wonder Liquid'. Justify this statement by giving any two reasons.
44. What are the effects of acid rain?
45. What are biogeochemical cycles? Names two examples.
46. In which regions is soil erosion very difficult to revert?
47. What is meant by depletion of ozone layer? Mention one important feature of ozone in atmosphere. Identify the factors responsible for the formation of ozone hole
48. Why is water essential for life?

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ASSIGNMENT QUESTIONS SET – 2
CHAPTER – 14
NATURAL RESOURCES

1. The atmosphere of the earth is heated by radiations which are mainly
 - (a) Radiated by the sun
 - (b) Re-radiated by land
 - (c) Re-radiated by water
 - (d) Re-radiated by land and water
2. If there were no atmosphere around the earth, the temperature of the earth will
 - (a) Increase
 - (b) Go on decreasing
 - (c) increase during day and decrease during night
 - (d) Be unaffected
3. What would happen, if all the oxygen present in the environment is converted to ozone?
 - (a) We will be protected more
 - (b) It will become poisonous and kill living forms
 - (c) Ozone is not stable, hence it will be toxic
 - (d) It will help harmful sun radiations to reach earth and damage many life forms.
4. One of the following factors does not lead to soil formation in nature
 - (a) The sun
 - (b) Water
 - (c) Wind
 - (d) Polythene bags
5. The two forms of oxygen found in the atmosphere are
 - (a) Water and ozone
 - (b) Water and oxygen
 - (c) Ozone and oxygen
 - (d) Water and carbon-dioxide
6. Name the process in which water vapour changes to a liquid.
7. Which gas is the chief component of Earth's atmosphere?
8. Name the substance that reduces the amount of dissolved oxygen in water.
9. Which gas is formed in the layers of Earth due to bacterial decomposition in the absence of oxygen?
10. Name the rays essential for formation of ozone in atmosphere.
11. Name the elements present in fossil fuels, which cause air pollution.

12. In a coastal region, what would be the direction of wind during the day?
13. When clouds cool down, water droplets fall to the land as rain, hail or snow. Name the phenomenon.
14. Name the organisms found to be very sensitive to the levels of contaminants like sulphur dioxide in the air.
15. What do you mean by humus?
16. Give two examples of exhaustible natural resources.
17. Name two atmospheric gases responsible for causing acid rain.
18. How would you define the term atmosphere?
19. What do you understand by the term 'Natural resources'?
20. What is strip-cropping?
21. What portion of our country's geographical area is covered by forest?
22. Name any two examples of inexhaustible natural resources.
23. How much air is required by a normal human being in one day?
24. What is conversion of ammonia into nitrates called?
25. State the role of the atmosphere in climate control?
26. How following factors contribute in formation of soil ? (a) wind (b) water (c) Sun
27. Acid rain and smog are said to be the consequences of air pollution. How are they caused?
What are the ill effects of breathing polluted air on human health?
28. What is Smog?
29. What is green house effect? List two green house gases. State the ultimate effect of increase in green house gases in the environment.
30. What makes the biosphere dynamic but stable system ?
31. The atmosphere acts as a blanket. How ?
32. What is soil? How is it formed? State the major factor that decides the structure of a soil.
What role does it play ?
33. Write the importance of ozone in the atmosphere.
34. (a) List two activities of man which lead to environmental pollution. (b) List any two uses of carbon in living organisms.
35. List two forms of oxygen found in the atmosphere. Name the process(s) by which (i) oxygen from the atmosphere is used up. (ii) oxygen is returned to the atmosphere
36. State various steps and processes involved in the nitrogen cycle in nature. Also show cycling of various nutrients in this cycle.
37. Write a note on how forests influence the quality of air, soil and water resources.

38. How is atmosphere on our Earth different from the atmosphere on Venus and Mars ? State two ways by which percentage of carbon dioxide is fixed on the earth.
39. “Urbanization and industrialisation is mainly responsible for the increase in environment pollution” Justify this statement and suggest ways and means to check it.
40. Why is the atmosphere essential for life?
41. Why is water essential for life?
42. How are living organisms dependent on the soil? Are organisms that live in water totally independent of soil as a resource?
43. You have seen weather reports on television and in news paper. How do you think we are able to predict the weather?
44. We know that many human activities lead to increasing levels of pollution of air, water bodies and soil. Do you think that isolating these activities to specific and limited areas would help in reducing pollution?
45. Write a note on how forests influence the air, soil and water resources.
46. What is ‘Water Cycle’ ? Explain the process of water cycle.
47. Write a short note on ‘Nitrogen Fixation’
48. Explain the ‘Nitrogen Cycle
49. Discuss the consequences of the increase in the concentration of Carbon Dioxide and other Green House gases in the atmosphere
50. What are the causes of Soil Erosion?
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ASSIGNMENT QUESTIONS SET – 3
CHAPTER – 14
NATURAL RESOURCES

1. What is soil erosion ? List two activities which cause soil erosion.
2. What is green house effect ? How is it caused ?
3. Many municipal Corporations are trying water harvesting to improve the availability of water. Give reason.
4. Rain water sometimes contains traces of acid. Why ? Explain in brief.
5. Define the term 'Smog'. Name two types of diseases caused by regularly breathing the polluted air.
6. Give reasons of the following : (i) We are lucky that ozone is not stable near the earth's surface. (ii) The combustion of fossil fuels increases the amount of suspended particles in air.
7. Why is water so necessary for all living organisms ? Mention any two points in support of your answer. 'Water is known as A Wonder Liquid'. Justify this statement by giving any two reasons.
8. What is atmospheric fixation of Nitrogen ?
9. What is soil erosion ? State any one way by which it can be prevented.
10. What is humus ? What is the role of earth worms in increasing the quantity of humus ?
11. List two ways by which carbon dioxide is 'fixed' in the environment.
12. Name two diseases caused due to an increased content of pollutants in the air produced due to the burning of fossil fuels. [2011 (T-II)]
13. The heaps of solid waste are a menace. Give two reasons.
14. How addition of undesirable substances and change in temperature affect the water life.
15. State any two harmful effects each of : (a) Air pollution and (b) Water pollution
16. What is the role of atmosphere in climate control ?
17. What percentage of nitrogen and oxygen is present in air ?
18. Mention any two human activities which are responsible for water pollution.
19. Mention the role of ozone layer in the atmosphere.
20. Give reason Lichens do not grow in Delhi whereas they commonly grow in Manali or Darjeeling.
21. What causes acid rain? Mention any damage caused by it on living organisms.
22. What is Green House Effect ? Name compounds causing depletion of Ozone layer ?
23. How do Sun and wind influence the formation of soil ?
24. List any two consequences of global warming.
25. Mention any four measures that should be taken to maintain the soil fertility.
26. Give the chemical formula of ozone. What is its role in atmosphere ?

27. How the presence of pollutants present in the air does affect our health ?
28. Name two air pollutants which when dissolve with water gives rise to acid rain.
29. Name two measures that can be taken to reduce water pollution.
30. Suggest two methods to control air pollution.
31. Differentiate between biodegradable and nonbiodegradable pollutants.
32. Name the process that returns oxygen to the atmosphere.
33. Write the condition responsible for poor visibility in cold weather.
34. Which symbiotic life forms can grow on stones and help in the formation of soil ? Write the mode of their action for making soil from rocks.
35. Why does moon have very cold and very hot temperature variations i.e. from -190°C to 110°C even though it is at the same distance from the sun as earth ?
36. Why does Mathura refinery pose problem to the Taj Mahal ?
37. Explain the role of atmosphere as a blanket. List the factors deciding the rainfall patterns.
38. State the effect of the following on aquatic organisms– (a) Removal of dissolved oxygen
(b) Change in temperature
39. How do forest play an important role in maintaining water cycle.
40. Name the two gases given out by burning of fossil fuels which dissolve in rain water to form acid rain.
41. Why is atmosphere essential for life? Write two points in support of your answer.
42. List any four activities that you think would lead to air pollution.
43. How are clouds formed ?
44. Why do terrestrial forms require fresh water ?
45. Mention any two processes involved in water cycle.
46. How do fossil fuel cause air-pollution ?
47. What is top soil ? Mention any two factors that decide which plants will thrive on that soil.
48. How do the rivers from land, add minerals to sea water?
49. How can we prevent the loss of top soil?
50. Why does the percentage of gases like oxygen, nitrogen and carbon dioxide remain almost the same in the atmosphere?
51. Lichens are called pioneer colonisers of bare rock. How can they help in formation of soil?
5. Why do people love to fly kites near the seashore?
52. Why does water need conservation even though large oceans surround the land masses?
53. "Soil is formed by water." If you agree to this statement then give reasons.
54. During summer, if you go near the lake, you feel relief from the heat. Why?
55. "The flow of energy is unidirectional whereas the biogeochemical transfer is cyclic".
Explain why ?
56. Justify the statement "The nitrogen cycle is supposed to be an ideal cycle in the biosphere".
57. List three ways to control soil pollution.

58. In coastal area, wind current moves from the sea towards the land during day; but during night it moves from land to the sea. Discuss the reason.
59. Following are a few organisms (a) lichen (b) mosses (c) mango tree (d) actus. Which among the above can grow on stones; and also help in formation of soil? Write the mode of their action for making soil.
60. Why does moon have very cold and very hot temperature variations, eg. from -190°C to 110°C even though it is at the same distance from the Sun as the Earth is?
61. There is mass mortality of fishes in a pond. What may be the reasons?
62. Soil formation is done by both abiotic and biotic factors. List the names of these factors by classifying them as abiotic and biotic?
63. All the living organisms are basically made up of C, N, S, P, H and O. How do they enter the living forms? Discuss.
64. Why does the percentage of gases like oxygen, nitrogen and carbon dioxide remain almost the same in the atmosphere?
65. Why are root nodules useful for the plants?
66. Many human activities lead to increasing levels of pollutions of air, water bodies and soil. "Isolating these activities to specific and limited areas would not help in reducing pollution". Justify this statement giving at least five reasons.
67. Explain with the help of a labelled diagram carbon cycle in nature.
68. Describe green house effect. How the presence of green house gases would lead to global warming ? Explain.
69. Draw a neat labelled diagram of water cycle in nature.
70. With the help of a neat labelled diagram, depict the cycling of carbon in nature.
71. Mention the two ways in which carbon dioxide is fixed in the environment.
72. Make neat and labelled sketch of Nitrogen cycle in nature.
73. Describe in brief the role of Nitrogen fixing bacteria and of lightening in fixing atmospheric nitrogen.
74. In coastal area, wind current moves from sea towards the land during day; but during night it moves from land to sea. Discuss the reason.
75. How are CFCs harmful for the environment and living beings ?
76. What are the forms of oxygen found in the atmosphere ?
77. "Forests influence the quality of our air, soil and water resources". Justify the statement.
78. Mention the two forms of oxygen found in atmosphere.
79. Name the form of oxygen absorbing U.V. rays.
80. Draw flow diagram of oxygen cycle.
81. What do you understand by ozone layer depletion ?
82. What is air pollution ? How does air pollution affect animal and plant life ?
83. Draw a labelled diagram to show carbon cycle in nature.

84. What are the two ways by which CO₂ is returned to the atmosphere ?
85. What are the causes of increase in the concentration of carbon dioxide in the atmosphere?
How is carbon dioxide converted into organic compounds? Justify with the help of a labelled diagram.
86. Why is circulation of water necessary in the environment ? Discuss any two human activities which are disturbing the water cycle.
87. With the help of a labelled diagram show the cycling of carbon in nature. What are the two ways in which carbon di-oxide is fixed in the environment.
88. With the help of diagram depict the oxygen cycle in nature. What is the % of oxygen present in atmosphere ? What is the role of ozone layer and how is it getting depleted ?
89. How do clouds formed in the sky ? Draw the biogeochemical cycle involved in it. What are the different states in which water is found in the water cycle ?
90. What are biogeochemical cycles ? Draw a labelled diagram to illustrate cycling of oxygen in nature. Write the means of returning oxygen to the atmosphere.
91. What is nitrogen fixation ? Why do plant need to fix nitrogen ? Draw a labelled diagram to illustrate nitrogen - cycle.
92. Draw a labelled diagram of carbon cycle in nature. Describe the role of photosynthesis and respiration in carbon cycle.
93. Study the given figure of Nitrogen cycle and mention what do A, B, C, D, E represents.
What will happen if step A does not occur? Write the role of N₂ fixing bacteria in the
94. Biosphere. Name two biologically important compounds that contains both O₂ and N₂
95. What are the types of natural resources?
96. Why plants do not utilise nitrogen directly from atmosphere?
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ASSIGNMENT QUESTIONS SET – 4
CHAPTER – 14
NATURAL RESOURCES

1. The atmosphere of the earth is heated by radiations which are mainly
 - (a) radiated by the sun
 - (b) re-radiated by land
 - (c) re-radiated by water
 - (d) re-radiated by land and water
2. If there were no atmosphere around the earth, the temperature of the earth will
 - (a) increase
 - (b) go on decreasing
 - (c) increase during day and decrease during night
 - (d) be unaffected
3. What would happen, if all the oxygen present in the environment is converted to ozone?
 - (a) We will be protected more
 - (b) It will become poisonous and kill living forms
 - (c) Ozone is not stable, hence it will be toxic
 - (d) It will help harmful sun radiations to reach earth and damage many life forms.
4. One of the following factors does not lead to soil formation in nature
 - (a) the sun
 - (b) water
 - (c) wind
 - (d) polythene bags
5. The two forms of oxygen found in the atmosphere are
 - (a) water and ozone
 - (b) water and oxygen
 - (c) ozone and oxygen
 - (d) water and carbon-dioxide
6. The process of nitrogen-fixation by bacteria does not take place in the presence of
 - (a) molecular form of hydrogen
 - (b) elemental form of oxygen
 - (c) water
 - (d) elemental form of nitrogen
7. Rainfall patterns depend on
 - (a) the underground water table
 - (b) the number of water bodies in an area
 - (c) the density pattern of human population in an area
 - (d) the prevailing season in an area
8. Among the given options, which one is not correct for the use of large amount of fertilisers and pesticides?
 - (a) They are eco-friendly
 - (b) They turn the fields barren after some time
 - (c) They adversely affect the useful component from the soil
 - (d) They destroy the soil fertility

9. The nitrogen molecules present in air can be converted into nitrates and nitrites by
 - (a) a biological process of nitrogen fixing bacteria present in soil
 - (b) a biological process of carbon fixing factor present in soil
 - (c) any of the industries manufacturing nitrogenous compounds
 - (d) the plants used as cereal crops in field
10. One of the following processes is not a step involved in the water-cycle operating in nature
 - (a) evaporation
 - (b) transpiration
 - (c) precipitation
 - (d) photosynthesis
11. The term “water-pollution” can be defined in several ways. Which of the following statements does not give the correct definition?
 - (a) The addition of undesirable substances to water-bodies
 - (b) The removal of desirable substances from water-bodies
 - (c) A change in pressure of the water bodies
 - (d) A change in temperature of the water bodies
12. Which of the following is not a green house gas?
 - (a) Methane
 - (b) Carbon dioxide
 - (c) Carbon monoxide
 - (d) Ammonia
13. Which step is not involved in the carbon-cycle?
 - (a) Photosynthesis
 - (b) Transpiration
 - (c) Respiration
 - (d) Burning of fossil fuels
14. ‘Ozone-hole’ means
 - (a) a large sized hole in the ozone layer
 - (b) thinning of the ozone layer
 - (c) small holes scattered in the ozone layer
 - (d) thickening of ozone in the ozone layer
15. Ozone-layer is getting depleted because of
 - (a) excessive use of automobiles
 - (b) excessive formation of industrial units
 - (c) excessive use of man-made compounds containing both fluorine and chlorine
 - (d) excessive deforestation.
16. Which of the following is a recently originated problem of environment?
 - (a) Ozone layer depletion
 - (b) Green house effect
 - (c) Global warming
 - (d) All of the above
17. When we breathe in air, nitrogen also goes inside along with oxygen. What is the fate of this nitrogen?
 - (a) It moves along with oxygen into the cells
 - (b) It comes out with the CO₂ during exhalation
 - (c) It is absorbed only by the nasal cells
 - (d) Nitrogen concentration is already more in the cells so it is not at all absorbed.

- 18.** Top-soil contains the following
- (a) Humus and living organisms only
 - (b) Humus and soil particles only
 - (c) Humus, living organisms and plants
 - (d) Humus, living organisms and soil particles.
- 19.** Choose the correct sequences
- (a) CO_2 in atmosphere \rightarrow decomposers \rightarrow organic carbon in animals \rightarrow organic carbon in plants
 - (b) CO_2 in atmosphere \rightarrow organic carbon in plants \rightarrow organic carbon in animals \rightarrow inorganic carbon in soil
 - (c) Inorganic carbonates in water \rightarrow organic carbon in plants \rightarrow organic carbon in animals \rightarrow scavengers
 - (d) Organic carbon in animals \rightarrow decomposers \rightarrow CO_2 in atmosphere \rightarrow organic carbon in plants
- 20.** Major source of mineral in soil is the
- (a) parent rock from which soil is formed
 - (b) plants
 - (c) animals
 - (d) bacteria
- 21.** Total earth's surface covered by water is
- (a) 75%
 - (b) 60%
 - (c) 85%
 - (d) 50%
- 22.** Biotic component of biosphere is not constituted by
- (a) producers
 - (b) consumers
 - (c) decomposer
 - (d) air
- 23.** An increase in carbondioxide content in the atmosphere would not cause
- (a) more heat to be retained by the environment
 - (b) increase in photosynthesis in plants
 - (c) global warming
 - (d) abundance of desert plants
- 24.** Oxygen is returned to the atmosphere mainly by
- (a) burning of fossil fuel
 - (b) respiration
 - (c) photosynthesis
 - (d) fungi
- 25.** Low visibility during cold weather is due to
- (a) formation of fossil fuel
 - (b) unburnt carbon particles or hydrocarbons suspended in air
 - (c) lack of adequate power supply
 - (d) none of these
- 26.** Growth of Lichens on barren rocks is followed by the growth of
- (a) moss
 - (b) ferns
 - (c) gymnosperms
 - (d) algae

- 27.** Marked temperature changes in aquatic environment can affect
- (a) breeding of animals
 - (b) more growth of aquatic plants
 - (c) process of digestion in animals
 - (d) availability of nutrients.
- 28.** Soil erosion can be prevented by
- (a) raising forests
 - (b) deforestation
 - (c) excessive use of fertilizer
 - (d) overgrazing by animals
- 29.** What happens when rain falls on soil without vegetational cover?
- (a) Rain water percolates in soil efficiently
 - (b) Rain water causes loss of surface soil
 - (c) Rain water leads to fertility of the soil
 - (d) Rain water does not cause any change in soil
- 30.** Oxygen is harmful for
- (a) ferns
 - (b) nitrogen fixing bacteria
 - (c) chara
 - (d) mango tree
- 31.** Rivers from land, add minerals to sea water. Discuss how?
- 32.** How can we prevent the loss of top soil?
- 33.** How is the life of organisms living in water affected when water gets polluted?
- 34.** During summer, if you go near the lake, you feel relief from the heat, why?
- 35.** In coastal area, wind current moves from the sea towards the land during day; but during night it moves from land to the sea. Discuss the reason.
- 36.** Following are a few organisms (a) lichen (b) mosses (c) mango tree (d) cactus
Which among the above can grow on stones; and also help in formation of soil? Write the mode of their action for making soil.
- 37.** Soil formation is done by both abiotic and biotic factors. List the names of these factors by classifying them as abiotic and biotic?
- 38.** All the living organisms are basically made up of C, N, S, P, H and O. How do they enter the living forms? Discuss.
- 39.** Why does the percentage of gases like oxygen, nitrogen and carbon dioxide remain almost the same in the atmosphere?
- 40.** Why does moon have very cold and very hot temperature variations eg, from -190°C to 110°C even though it is at the same distance from the sun as the earth is?
- 41.** Why do people love to fly kites near the seashore ?
- 42.** Why does Mathura refinery pose problems to the Taj Mahal?
- 43.** Why do not lichens occur in Delhi whereas they commonly grow in Manali or Darjeeling?
- 44.** Why does water need conservation even though large oceans surround the land masses?
- 45.** There is mass mortality of fishes in a pond. What may be the reasons ?

46. Lichens are called pioneer colonisers of bare rock. How can they help in formation of soil?
47. “Soil is formed by water.” If you agree to this statement then give reasons
48. Fertile soil has lots of humus. Why?
49. Why step farming is common in hills?
50. Why are root nodules useful for the plants?
51. How do fossil fuels cause air pollution?
52. What are the causes of water pollution? Discuss how you can contribute in reducing water pollution.
53. A motor car, with its glass totally closed, is parked directly under the sun. The inside temperature of the car rises very high. Explain why?
54. Justify “Dust is a pollutant” ?
55. Explain the role of the Sun in the formation of soil.
56. Carbon dioxide is necessary for plants. Why do we consider it as a pollutant?
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