Botany – [Part 1 to 14]

1. Animals in Daily Life

1. What are the classification of animals?

   Based on the utility of animals, they are classified into three groups as,

   - Food yielding animals
   - Fiber yielding animals
   - Draught animals

2. What are food yielding animals?

   Animals are reared for milk, eggs and meat. Breeds of cows are mainly raised for milk eg. Jersey . Certain breeds of goat are reared for milk and meat. Honey bees give us honey. Fishes are a good source of protein.

3. What are fiber yielding animals?

   Animals such as sheep, Llama and goat provide us fur. The fur is processed into wool. Silk moth gives us silk fibre.

4. What are draught animals?

   Animals which are used for ploughing and transporting are called draught animals. Bullock (kangeyam),Ox , horse, elephant, donkey, etc are employed in farm activities and transport.

5. Name some animal products?

   - Wool: Wool is obtained from hairs on the bodies of animals such as sheep, llama and goat. It is used to make sweaters, shawls, blankets, socks, hand gloves etc.
   - Meat: Animals such as goat, sheep, pig, poultry birds, prawn, crab etc. yield flesh as food.
   - Silk: Silk is obtained from silkworm and it is used for making silk clothes.

- Leather: The skin of animals such as goat, sheep, and cattle is used for manufacturing leather goods(bags, shoes, purses, suitcases, belts).
- Pearl : Pearl is a valuable gem obtained from pearl oysters and is used in making ornaments.
- Lac : Some insects secrete a resin like substance called lac. It is used for making paints, varnish, printing inks and cosmetics.
- Milk: Animals like cows, buffaloes and goats give milk as food.
- Honey: Honey is obtained from honey bees. It is consumed along with food and used in the preparation of certain medicines.
- Egg: Poultry birds such as hen, duck, goose and turkey give us eggs as food.

6. What is wool?

   Wool is a thick coat of hairy fibres(fleece) obtained from sheep, goat, yak and other animals. It is composed of a protein called keratin. Several breeds of sheep are reared in our country that yield different kinds of wool. The skin of sheep has two types of hair. a) Coarse beard hair and b) Fine soft under hair.

7. What is shearing?

   There are many steps involved in processing the fur into wool. The process of cutting off the woollen fleece of sheep with a thin layer of skin is called shearing.

8. How is silk made?

   Silk is also a natural animal fibre. Silk worm secretes the silk fibre. The best known type of silk is obtained from the cocoon of larvae of mulberry silkworm. Silk fabric was first developed in ancient China.

9. What are the uses of silk?

Silk is used for making silk clothes, parachutes, insulation coils for telephone and wireless receivers.

10. Which is called as queen of fibers?

Pure silk is one of the finest natural fibres and is said to be the "queen of fibres"

11. What is sericulture?

The rearing of silk worms for obtaining silk is called Sericulture.

12. What are the types of silk?

- Mulberry silk
- Tassar silk
- Eri silk
- Muga silk

13. What is reeling?

The process of taking out threads from the cocoon is called Reeling.

14. Name famous places for silk in Tamil Nadu?

Kancheepuram, Siruvanthadu, Thirubhuvanam and Arani are famous for silk in Tamil Nadu.

15. What is honey combs?

Honey bees live in beehives. A beehive consists of numerous small compartments called honey combs.

16. What are the types of beehives?

- Queen bee(fertile female bee).
- The drones (fertile male bees)
- The workers (sterile female bees)

17. Name some Indian varieties of bees?

- Rock bee (Apis dorsata)
- Little bee (Apis florea) and
- Indian bee (Apis indica)

18. What are the composition of honey?

Composition of Honey.

- Sugar - 75%
- Water - 17%
- Minerals - 8%

19. What is apiculture?

The rearing of honey bees to produce honey in large scale is known as apiculture

20. What is poultry farming?

The rearing of hens and other fowls to produce eggs and flesh is called Poultry farming

21. What is poultry farm?

The place where the fowls are reared is called Poultry farm.

22. What is layers?

In our country, hen is the most favourite domestic bird. Poultry keeping has developed into a very big industry. Some varieties of hens are reared for the production of eggs only. Such hens are called layers.

23. What are broilers?

There are some varieties of hens grown for flesh. They are called broilers.

24. What are broody hens?

The poultry house should be well lighted and well ventilated. The common poultry feed is grains and lots of fresh water. Hens that hatch eggs are called Broody hens.

25. What is silver revolution?

The massive step taken in India to increase egg production by adopting enlightened practices of poultry is called Silver Revolution.

26. What is TAPCO?

Tamil Nadu Poultry Development Corporation

27. Why are domestic animal cared for?

- Providing animals with good feed and clean drinking water to keep them fit and healthy.
- Providing shelters that are clean, airy and well lighted .
- Protecting them from diseases

28. What are endangered animals?

If an animal no longer exists, it is said to be extinct. If they are in danger of becoming extinct, they are said to be endangered.

29. What is wildlife conservation?

Wildlife protection and maintenance is called wildlife conservation.

30. What is blue cross?

Blue Cross is a registered animal welfare society. It helps to find homes for uncared animals and promote animal protection.

2. Plant Morphology

1. What are living things?

Things that have life are called living things. eg. Plants and animals

2. What are non-living things?

Things that do not have life are called non-living things. eg. Rock, book.

3. What are the characteristics of living things?

- Need food,
- Respire to convert food into energy.
- Grow at certain stages of life.
- Respond to their surroundings.
- Live for a definite span of time.
- Reproduce their own kind.
- Are made up of cells.

4. What s habitat?

The living place of a plant provides food, shelter and suitable climate to survive and reproduce successfully. Such a place the living place of a plant provides food, shelter and suitable climate to survive and reproduce successfully. Such a place is called as habitat.

5. How are plants classified by WARMING?

WARMING (1909) classified the plants into three types on the basis of their water requirement. They are

1. Hydrophytes
2. Mesophytes
3. Xerophytes

6. What is hydrophytes?

Hydrophytes means water plants (Hydro = Water, and Phytes = Plants). These plants live in the water of ponds, lakes and rivers. Plants which live in water are called hydrophytes.

7. How are hydrophytes classified?

a) Free-floating hydrophytes

b) Attached floating hydrophytes

c) Submerged hydrophytes

8. What are the adaptation of hydrophytes?

- Root system is poorly developed. In some cases roots are even absent.
- Stem is thick, short and spongy with air spaces to float in water.
- Leaves have a waxy-coat that prevents their decay in excess water

9. What is mesophytes?

These plants grow in places with moderate water supply. They cannot grow in places with too much of water or too little water. Most of the crop plants are mesophytes. eg. Wheat, maize, sunflower, mango, neem.

10. What is xerophytes?

Xerophytes means desert plants: (Xero = Desert and Phytes = Plants). Plants which grow in dry areas (deserts) are called Xerophytes. The plant body is adapted to cope with the water scarcity, high temperature, strong winds, etc.

eg. Opuntia (chappathikalli).

11. How are flowering plant grouped?

Flowering plants can be grouped based on their size of stem. They are herbs, shrubs and trees.

12. What are herbs?

- Small plants with soft and green stems are called herbs.
- They are non-woody plants and do not grow more than one metre in height.
- eg. Radish, wheat, paddy, sunflower.

13. What are shrubs?

- The medium sized plants with a thin but hard and woody stem are called shrubs.
- They do not have a clear main stem.
- They tend to branch and become bushy.
- eg. Rose, jasmine, croton, Tulsi, lemon.

14. What are trees?

- Tall and big plants with a distinct hard and woody stem are called trees.
- The main stem is called trunk which gives out branches and leaves.
- eg. Neem, mango, teak, coconut, banyan.

15. What are parts of plant?

- A typical flowering plant consists of two main systems, viz. Root System (underground part), and Shoot System (aerial part).
- The root System consists of main root and its lateral branches. The Shoot System has a stem, branches and leaves.
- The flowering plant produces flowers, fruits and seeds at maturity.
- Root, stem and leaves are called vegetative parts of a plant as they do not take part in reproduction.
- Flowers, fruits and seeds are reproductive parts of a plant as they take part in reproduction.

16. What is root system?

The part of the plant which grows under the soil is called Root System. It usually develops from the radicle of embryo. It is the descending part of the plant. It grows away from sunlight. It does not have chlorophyll. Nodes and Inter-nodes are absent. It does not bear leaves or buds. Root system is broadly classified in two types. They are

- Tap root system
- Adventitious root system

17. What is tap root system?

The radicle of the embryo grows deep into the soil and becomes the primary root (tap root). This root gives rise to lateral roots such as secondary roots and tertiary roots. Generally dicot plants have tap root system. eg. Mango, neem, carrot, radish, etc.

18. What are adventitious root system?

Roots that grow from any part of the plant other than the radicle are called adventitious roots. These roots arise in cluster which are thin and uniform in size. As these roots arise in cluster, they are also called as fibrous roots. Most monocot plants show adventitious roots.

19. What are the normal functions of stem?

1. Support: The stem holds the branches, leaves, flowers and fruits.

2. Conduction: The stem transports water and minerals from roots to the upper parts. It also transports the prepared food from leaves to other parts.

20. What is leaf?

Leaf is a thin, broad, flat and green part of the plant. The leaf consists of three main parts. They are leaf blade (leaf lamina), leaf stalk (Petiole) and leaf base.

21. What are the main functions of leaf?

1. Synthesis of Food: Leaves produce food by photosynthesis.

2. Exchange of Gases: Leaves exchange gases through stomata. Plants take in carbon dioxide and give out oxygen during photosynthesis. They take in oxygen and give out carbon dioixide during respiration. This is called exchange of gases in plants.

3. Transpiration: The loss of excess water from the leaf in the form of water vapour through stomata is called transpiration.

22. What is flower?

Flower is called the reproductive part of a plant because it helps in sexual reproduction. The flower changes into fruit after pollination and fertilization.

Like leaves, flowers also have stalk. The stalk of a flower is called pedicel.

There are stalk less flowers also. eg. Banana.

23. What are the parts of flower?

A flower has four parts, viz. Calyx, Corolla, Androecium and Gynoecium

24. What is Calyx?

The green, leaf like parts in the outermost circle of a flower are called sepals. They protect the flower when it is a bud.

25. What is Corolla?

The brightly coloured parts of a flower are called Petals. They are the second part of the flower They can be of different colours, shapes and sizes.

26. What is Androecium?

The stamen is the third part of a flower. It is the male part of the flower. Each stamen consists of a stalk called filament and a bag like structure on the top of filament called anther. Anther forms pollen grains which are the male gametes.

27. What is Gynoecium?

It is the inner most part of the flower. It is the female part of a flower. A carpel has three parts. The upper part of the carpel is the stigma. The middle part is called style. The lower swollen part is called ovary. Ovary contains ovule which has the egg (female gamete).

28. What is storage roots?

The tap root becomes thick and fleshy due to storage of food materials. Based on the shape of the root, they are

a) Conical: The root is broad at the apex and gradually tapers towards the base like a cone. eg: Carrot

b) Fusiform: When the root is swollen in the middle and tapers gradually towards both the ends like a spindle, it is called fusiform. eg: Radish.

c) Napiform: When the root is swollen at the apex coming almost spherical and tapers suddenly towards the base give a top-like appearance, it is called napiform. eg: Turnip, beetroot.

29. What are respiratory roots?

Plants which grow in saline swamps near the sea shore develop numerous upright aerial roots called respiratory roots. They help in breathing. eg. Avicennia (vellai alayatri) It is found at Pitchavaram in Tamilnadu.

30. What is supporting roots?

a) Prop Roots: A number of roots are produced from aerial branches. These roots grow vertically downward and fix into the ground. These roots act as pillars and

give additional support to the main plant. Such roots are called prop roots. eg. Banyan.

b) Stilt Roots: Plants with delicate stems develop short and thick supporting roots from the basal part of the stem. They fix to the ground and give support.Such roots are called stilt root. eg. Maize, sugarcane.

31. What is tuber?

It is modified underground stem which develops by swelling of tip of stem. It stores a large amount of food. Eg: Potato

32. What is Rhizomes?

These are thickened stem that grow horizontally under the soil. Eg ginger.

33. What are the types of creepers?

The Creepers are of two types.

(a) Runners: eg. Grass, Pumpkin

(b) Stolons: eg. Strawberry

34. What is Phylloclade?

In some xerophytes, the leaves are reduced to spines. The function of the leaves is taken over by the stem which is green and flat. Such a stem is called phylloclade. eg. Opuntia

35. What is modification of leaf?

a) Leaf Tendril: In some plants, the leaf is modified into slender, wiry coiled structure, known as tendril. They help in climbing. eg. Pea

b) Leaf-Spine: In opuntia, the leaves are reduced to spines. They are protective in function and prevent transpiration. eg. Opuntia.

c) Pitcher: In some plants, the leaves are modified into pitcher to trap insects to fulfill their nitrogen deficiency. eg. Nepenthes.

d) Bladder: In some plants, the leaf is modified into a bladder, to trap insects. eg. Utricularia. (Bladder-wort)

36. What are kinds of stem?

perform their various functions. Based on the texture, stems of plants are grouped under three broad categories.

1) Reduced Stems: In some plants, the stem is reduced to small disc. Nodes and inter-nodes are absent in the disc. eg. Radish, carrot, turnip, onion.

2) Erect Stems: Most of the flowering plants possess upright erect woody stems.

eg. Bamboo, banyan, eucalyptus, coconut

3) Weak Stems: There are thin, soft and delicate stems which cannot stand erect without support. They are two types.

- Upright Weak Stems: They may be twiners or climbers

a) Twiners: The stems are long, slender, flexible and very sensitive. They coil around an upright support without any special structure. eg. bean.

b) Climbers: They climb up the support with some clinging structures eg. Betelvine (vetrilai), pepper (Milagu).

- Prostrate Weak Stems: These stems spread over the ground. They may be trailers or creepers. eg. Tridax (vettukaya poondu).

37. What are the types of tropism?

There are three types of tropism.

a) Phototropism: The tendency of the plant parts to grow either towards or away from the direction of sunlight, is called phototropism. Stem grows towards the sunlight. So, stem is positively phototropic. Root grows away from the sunlight. So, root is negatively phototropic.

b) Geotropism: Roots tend to grow towards the soil or gravity. This is called geotropism. Root is positively geotropic and stem is negatively geotropic.

c) Hydrotropism: The roots tends to grow towards the direction of water,

where as stem does not. So, root is positively hydrotropic and stem is negatively hydrotropic.

3. Crop Production and Management

1.Give note on Indian agriculture?

India is an agricultural country. We all totally depend on agriculture for our basic needs like food, clothing and shelter. Food is essential for our survival. It provides energy and materials required for the growth and maintenance of our body. Indian population had grown by 21.34% between 1991 and 2001. It is expected to exceed by 20% in 2050. Population of India in 2011 is around 1,21,01,93,422 (1.21 billion) people.

2. How is population affecting agriculture?

With the increase in population , the demand for food has also gone up. The available land for agriculture has been decreasing. Therefore improved, agricultural practices have to be introduced.

3. What is agricultural practice?

All the activities which are involved in the cultivation of crops from sowing to harvesting are known as agricultural practices.

4. What is agriculture?

Science that deals with the growing of plants and animals for human use is called agriculture.

5. What are the basic activities of crop production?

- Preparation of soil and sowing
- Adding manure and fertilizer
- Irrigation
- Protection from weeds

- Harvesting
- Storage and Marketing

6. What do turning and loosening of soil involves?

i) Ploughing or tilling

ii) Levelling and

iii) Manuring

7. What is ploughing and why is it important?

It is the process of loosening soil. Ploughing is important because it,

- Provides good aeration to roots in order to breathe
- Retains moisture for a long period
- Promotes growth of useful microorganisms to bring nutrient rich soil to the top
- Helps in the removal of undesirable plants (weeds)

8. How is ploughing carried out?

Ploughing is done in two ways

i) **Manual ploughing:** It is one of the old and traditional methods of agriculture. A farmer ploughs the field with a plough pulled by a pair of bulls.

ii) **Machinery ploughing**: Now a days ploughing is done by tractor driven cultivator. The use of cultivator saves labour and time.

9. What is leveling?

The ploughed field may have big pieces of soil crumbs, so, it is necessary to break these crumbs with the leveller. It also ensures uniform irrigation.

10. What is manuring?

Sometimes manure is added before tilling. It helps in proper mixing of manure with soil.

11. What is sowing?

It is the most important step of crop production. The process of putting seeds into the soil is called sowing.

12. How is sowing carried out?

Sowing is done by two methods.

- **Manual sowing:** It is the traditional method of sowing where the seeds are sown manually by scattering them in the moist soil.
- **Seed Drill:** It is a method of sowing the seeds through the funnel or using two or three pipes having sharp ends.

13. What is manure?

The substances which are added to the soil in the form of nutrients for the healthy growth of plants are called manure or fertilizers**.**

14. What is irrigation?

The process of supplying water to crops in the field at different intervals is called irrigation.

15. What is traditional method of irrigation?

In our country traditional systems of irrigation like,

- Pulley system (moat)
- Chain pump and
- Lever system (rahat)

Have been used for centuries to lift water from water reservoirs and supply it to the field for irrigation. These methods are cheaper but not much efficient.

16. What do modern methods of irrigation involves?

- Furrow irrigation
- Sprinkler irrigation
- Basin irrigation
- Drip irrigation

17. What is furrow irrigation?

In this method water is allowed to enter the field through channels of furrows made between two rows of crop. e.g., sugar cane, banana, paddy, etc.

18. What is sprinkler irrigation?

This irrigation is used where the soil cannot retain water for a long time. Here the water is sprinkled by sprinklers. e.g. Lawn

19. What is drip irrigation?

In this irrigation the water falls drop by drop directly at the position of the roots, so it is called drip irrigation. It is the best method to save water. It helps to irrigate grapes, banana, brinjal, etc.

20. What is water logging?

Care must be taken not to water the field excessively. Excess water on the field may cause a condition called water logging which may harm the crops.

21. Which is longest irrigated canal?

The Karakum canal in Turkmanisthan is the longest irrigation canal in the world. It is over 1300 km long.

22. What are the common types of weed?

- Grass
- Amaranthus
- Chenopodium

23. What is manual weeding?

Manual weeding: Weeds may be manually removed by hand by uprooting them or by using some tools like hand fork, khurpa and harrow.

24. What is chemical control in weeding?

The chemical substances which destroy the weeds but do not harm the crop are called weedicides. eg. Dalapon, metachlor, 2-4- Dichloro phenoxy acetic acid.

25. What is Bio- weedicides?

Bio- weedicides are the mechanism of using microorganism such as fungi and bacteria used to destroy weeds.

26. What is harvesting?

Once the crop gets matured, it has to be gathered. The process of cutting and gathering a matured crop is known as harvesting.

27. How is harvest season celebrated in India?

All over the world harvest season is celebrated with excitement. Pongal (Tamilnadu), Bihu (Assam), Holi (Punjab), Onam (Kerala), etc., are the harvest festivals celebrated in India.

28. What is threshing?

Grains are separated from the stalks by the process of threshing.

29. What is mechanical threshing?

This is carried out by beating the cut stalks against hard floor or with a machine called mechanical thresher

30. What is winnowing?

The chaff (pieces of straw and husk after threshing) is separated from the whole grain by winnowing.

31. What is green revolution?

The massive step taken to augment food production by adopting modern agricultural practices in India.

32. Name the market in Tamil Nadu?

“Uzhavar Sandhai”

33. Which is rice bowl of Tamil Nadu?

Thanjavur is said to be the Rice Bowl of Tamilnadu.

34. What is AGMARK?

Agmark grading and standardization is a central sector scheme to check the quality and standard for agricultural products. The grades given are Grade 1, 2, 3, 4 or Special, Good, Fair and Ordinary.

35. What is crop rotation?

The practice of growing a cereal crop and the pulse crop alternately in the same field in successive season is called as crop rotation.

36. What are the techniques used in plant improvement?

1. Selection: It is a process of choosing a desirable crop.

2. Hybridisation: A hybrid (new variety) is produced by crossing the already existing two varities with desirable qualities.

3. Polyploid breeding: Method to increase the chromosomal number.

4. Mutation breeding: Radiations (UV and X-rays) induces mutation to develop new variety of crops.

5. Protoplast fusion: Production of hybrids by the fusion of protoplasts along with nuclei of two different species.

6. Tissue culture: Culturing the plant tissue in artificial, controlled, aseptic conditions (in virto) to raise plantlets.

7. Genetic engineering: Its objective is to identify, isolate and introduce a desirable gene/genes into a crop plant that normally do not possess them. These new plants whose genes are modified/transferred are called transgenic plants.

37. What is genetic engineering?

Genetic engineering is a part of biotechnology. It offers new hope to the farmers who are struggling hard with plant pests and diseases.

38. What is the aim of agriculture biotechnology?

The aim of agricultural biotechnology is to give transgenic plants carrying desirable traits like

- Disease / Insect / Herbicide resistant.
- Increased photosynthetic efficiency.
- Nitrogen fixing ability.
- Increased size of storage roots, seeds, fruits and vegetables.
- Oil seeds (soya) rich in PUFA (poly unsaturated fatty acid) recommended for heart patients.
- Potatoes with vaccines, improves starch and vitamin A is produced

39. What is the use of bio technology in food processing?

- Production of additives and
- Processing aids.

4. Life Process

1. What is life process?

The maintenance of living organisms must go on even when they are not physically active. Even when we sit idle and during sleep this maintenance job, through the functioning of cells, has to go on. The life process includes the activities performed by the different organs to maintain the body.

2. What is nutrition?

Nutrition is the process of obtaining energy through consumption of food.

3. What is Respiration?

The process of acquiring oxygen through breathing and making it available to cells for the process of the breaking down of organic substances into simpler compounds called respiration.

4. What is Transportation?

Transportation is the process by which the food and oxygen is carried from one organ to the other organs in the body.

5. What is Excretion?

It is the process by which the metabolic waste by-products are removed from the different organs and released out from the body.

6. What are the type of nutrition?

- Autotrophic Nutrition
- Heterotrophic- Parasitic and Saprophytic

7. What is autotrophic nutrition?

Most of the green plants can synthesize their own food materials by photosynthesis. Such mode of nutrition is described as autotrophic nutrition.

8. What are the raw materials for photosynthesis?

The raw materials and other necessary substances required for photosynthesis are sunlight, water, CO2 and chlorophyll.

Sunlight - energy from the sun

Water - plant absorbs water from the soil through roots.

CO2 - assimilated from the atmosphere through leaves containing small pores called stomata.

Chlorophyll - the green pigments in the chloroplasts, an organelle of the cells of leaf.

9. What is Heterotrophic Nutrition?

Fungal cells do not contain chloroplasts and they are of two types saprophytes and parasites. Likewise all organisms except the green plants, do not possess

chloroplasts, as they do not perform photosynthesis. They depend upon plants or other organisms for their nutrition.

10. What is Parasites?

Some organisms live on other organisms for nourishment. They are called Parasites.

11. What are hosts?

The plants or animals on which the parasites live for nourishment are called hosts.

12. What is Saprophytes?

Some plants obtain nutrients from nonliving organic matter. They are called saprophytes. Many fungi and bacteria are saprophytes.

13. What is Intracellular Digestion?

Intracellular digestion is a very primitive form of digestion and does not require an organized digestive system.

14. What is Extracellular Digestion?

Digestion taking place in the space or lumen of the alimentary canal i.e. outside the cell, it is called as extracellular digestion – an advanced form of digestion.

15. What do the human digestive system contain?

The digestive system is composed of two groups of organs. They are

- The gastro-intestinal tract
- Accessory digestive glands

16. What is process of digestive system?

Digestion takes place step by step with the help of enzymes which are otherwise called bio-catalysts. The gastro-intestinal tract (alimentary canal) is a long muscular tube, about mtrs in length. It starts from the mouth and ends in the anus. The mouth, buccal cavity, pharynx, oesophagus, stomach, small intestine, large intestine, rectum and anus are parts of the alimentary canal.

17. What is ATP?

During respiration, the food materials are oxidized (degraded). During this reaction, energy is released from the food and it is stored in a special chemical (or) biological substance called ATP (Adenosine triphosphate). The energy of ATP is utilized for the various activities of the cells.

18. What are the types of respiration?

Depending on whether oxygen is used or not, respiration is classified into two types:

- Aerobic respiration.
- Anaerobic respiration

19. What is aerobic respiration?

In the majority of living organisms, oxygen is utilized during respiration. Respiration that uses oxygen is known as aerobic respiration.

20. What are the stages of aerobic respiration?

The process of Aerobic Respiration takes place in four stages:

- Glycolysis
- Oxidative decarboxylation of pyruvic acid
- Kreb's cycle
- Electron transport chain.

21. What is anaerobic respiration?

In some organisms, oxygen is not utilized for respiration. This type of respiration is known as anaerobic respiration. It is also known as fermentation.

22. Name respiratory organs of animals?

The repiratory organ of a fish is gills; a frog is its lungs and skin; for land vertebrates it is the lungs.

23. What is the respiratory process in human?

In human beings, air is taken into the body through the nostrils. The air that passes through the nostrils is filtered by fine hair that line the passage. This passage is also lined with mucous which helps in this process. From here, the air passes through the throat, to the lungs. Rings of cartilage are present in the throat to keep the air passage open and prevent it from collapsing.

24. What is Xylem?

Xylem transports water with dissolved minerals absorbed by the root hairs from the soil, to other parts of the plant.

25. What is Phloem?

Phloem transports products of photosynthesis (food) from the leaves to all other parts of the plant.

26. What is transpiration?

The loss of water in the form of vapour from the aerial parts of the plant is known as transpiration.

27. What is translocation?

The transport of the soluble products of photosynthesis is called translocation and it occurs in the part of the vascular tissue known as phloem.

28. What is Lymph?

In humans there is another type of fluid which is also involved in transportation. This is called lymph or tissue fluid. It is similar to the plasma of blood, but it is colorless and contains less protein.

29. What are the different ways of excretion in plants?

- Plant waste products are stored in cellular vacuoles.
- Waste products may be stored in leaves that fall.
- Other waste products are stored as resins and gums, especially in old xylem tissues.
- Plants also excrete some waste substances into the soil around them.

30. Why is kidney important?

Kidneys are vital organs for survival. Several factors like infection, injury or restricted blood flow reduce the activity of the kidneys, this leads to accumulation of poisonous wastes in the body, which can even lead to death.

31. What is artificial kidney?

In case of kidney failure, an artificial kidney can be used. An artificial kidney is a device to remove nitrogenous waste products from the blood through dialysis.

32. What is nephron?

Each Nephron consists of a filtering apparatus called glomerulus and uriniferous tubules.

33. What are the types of movement shown by plants?

Plants show two different types of movements:

- Movement independent of growth
- Movement dependent growth

34. Mention some ways of growth of plant?

- Response of the plant in the direction of light (Phototropism).
- Response of the plant in the direction of gravitational force (Geotropism).
- Response in the direction of water (Hydrotropism).
- Response in the direction of chemicals (Chemotropism).

5. Diversity of Organism

1. Who published the book `Origin of Species`?

Origin of Species' was published in the year 1859. It was written by a scientist Charles Darwin.

2. What is biology?

Biology is the science that deals with the study of living organisms. Botany and Zoology are the branches of Biology.

3. What is bio diversity?

Organisms differ in their character, habit, size, structure, nutrition and habitat. This is known as Bio-diversity.

4. What is micro organism?

Organisms that can be seen only under a microscope are called micro-organisms. They can be either unicellular or multicellular.

5. What is micro biology?

The study of micro-organisms is called Microbiology.

6. Name the disease caused by virus?

Common Cold	Rhino Virus
Polio	Polio Virus
Chicken pox	Herpes Virus
Tobacco Mosaic Disease	Tobacco Mosaic

AIDS	HIV
Rabies	Rabdo Virus

7. Who discovered HIV virus?

In 1984, Robert Gallo discovered HIV which causes AIDS.

8. What is Bacteriology?

The branch of science that deals with bacteria is called Bacteriology.

9. What are the beneficial activities of bacteria?

- Curdling of milk
- Decomposition of organic wastes into manure.
- Fermentation of idly and dosai flour
- Act as bio-fertilizer increasing the yield.

10. What is fungi?

Most of the fungi are multicellular organisms. Penicillin is extracted from the fungus Penicillium notatum. It was discovered by SirAlexander Flemming in 1928. Certain fungi cause diseases like dandruff formation on our scalp.

11. What is algae?

Algae are unicellular and multicellular organisms. They have chlorophyll pigment which helps them to prepare their own food by the process of photosynthesis.

12. What are mushrooms?

We see small umbrella-like structures growing on the bark of trees, soil and wood during rainy season. These are called mushrooms.

13. What is micro algae?

Algae which can be seen only under a microscope (microscopic algae) are called micro algae.

14. What is macro algae?

Algae which can be seen with naked eyes are called macro algae. These are found in pond and sewage

15. What are worms?

Worms like tapeworm, hook worm and roundworm live in the small intestine of man. These cause indigestion, stomach ache, dysentery, stomatitis in man. Intake of well cooked food and boiled water is good for our health.

16.What are insects?

Insects like mosquito, housefly, honeybee are found everywhere. They have compound eyes. They are both beneficial and harmful to us.

17. What is Molluscs?

These are soft bodied organisms. They have muscular foot which helps in slow movement. They posses shell . Eg: Snail.

18. What is Echinoderms?

Their skin is covered with calcareous spines. Using these spines they attack

their enemies. They can regenerate the broken or lost parts. Some of these are exclusively marine. Eg: starfish, sea cucumber.

19. What are birds?

Generally birds are the most attractive creatures in nature because of their appearance and sweet voice. They are economically beneficial to us in many ways. They have four chambered heart. They are oviparous. Their body is covered with feathers. Respiration occurs through lungs.

20. Which is the largest living organism?

Blue whale is the largest living organism. Its weight is equal to the weight of 22 lephants. Its heart is of a size of a small car.

21.Which was the first animal to be sent to space?

Dog was the first animal sent to space. Its name was Laika. It was sent by Soviet Russia.

22. Where do cow has its sweat gland?

In cows, sweat glands are found on the surface of nose.

23. Which bird can fly forward, sideward and backward?

Humming Bird is the only bird that can fly forwards, backwards and sideways.

6. Basis of Classification

1. What is classification?

The system of sorting living organisms into various groups based on similarities and dissimilarities is called classification.

2. What is need of classification?

- Classification helps us to identify the living organisms easily.
- It helps us to learn about different kinds of plants and animals, their features, similarities and differences.
- It enables us to understand how complex organisms evolve from simple ones.

3. Who was R.H.Whittaker?

R.H.Whittaker (1920–1980) was an American plant ecologist. He was the first to propose the five kingdom classification of the world's biota, based on their evolutionary relationships. In 1969 he classified the organisms into five kingdoms. This classification has been accepted by all scientists.

4. What are the five kingdoms?

The Five Kingdoms are Monera, Protista, Fungi, Plantae and Animalia

5. What are the importance of five kingdom classification?

- Complexity of Cell structure (prokaryote to Eukaryote)

- Mode of nutrition (autotrophs and heterotrophs)
- Body organization (unicellular or multi-cellular)
- Phylogenetic or evolutionary relationship

6. What are the general features of monera?

- The kingdom Monera comprises all bacteria and the cyanobacteria.
- They are Primitive unicellular. (single cell organisms).
- They do not have a true nucleus (prokaryotic).
- Their mode of nutrition is autotrophic or heterotrophic.
- They cause diseases like diphtheria, pneumonia, tuberculosis, leprosy etc.
- They are also used in manufacture of antibiotics to cure many diseases.

7. When was bacteria discovered?

In 1675 Anton Von Leewvenhoek, a Dutch scientist, discovered bacteria. He called the bacteria as ‘animalcules’. Anton Von Leewvenhoek is called as

the father of bacteriology. Bacteria are considered as the first formed organisms in the world.

8. How are bacteria useful?

- Processing of tea and tobacco
- Recycling of waste materials
- Useful in agriculture
- Useful in industries
- Useful in medicines
- Tanning of leather

9. What is the feature of protista?

- Kingdom Protista includes unicellular eukaryotes.
- Animals and plants of Protista live in sea as well as in fresh water.
- Some are parasites. Though they are single celled they have the capacity of performing all the body activities.
- They have nucleus enclosed by a nuclear membrane (eukaryotic).
- Some of them posses chloroplast and make their food by photosynthesis. e.g.Euglena

10. What are the two groups of protista?

- Plant like protista which are photosynthetic are commonly called microalgae. They can be seen only under a microscope. They occur as single cells or filaments or colonies. eg. Chlamydomonas, Volvox etc. Algae are autotrophs.
- Animal like Protista are often called Protozoans. Protozoans include Amoeba and Paramoecium like animals. The Paramoecium, which consists of cilia, belongs to class Ciliata. Amoeba which consists of pseudopodia belongs to class Sarcodina. All unicellular plants are collectively called phytoplanktons and unicellular animals as zooplankton.

11. Which is called as “the queen of drugs”?

Penicillin is also known as “the queen of drugs”.

12. What do Kingdom Plantae includes?

Kingdom Plantae includes all multicellular plants of land and water.

- Algae (Multicellular) eg. Laminaria, Spirogyra, Chara
- Bryophytes eg. Riccia, Moss
- Pteridophytes eg. Ferns
- Gymnosperms eg. Cycas, Pinus
- Angiosperms eg. Grass, Coconut Mango, Neem (veppa maram)

13. What are the characteristics of kingdom animalia?

- This kingdom includes all multicellular eukaryotic animals.
- All animals show heterotrophic mode of nutrition. They directly or indirectly depend on plants for their basic requirements particularly the food.
- They form the consumers of an ecosystem.
- The cells have plasma membrane.
- They have contractibility of the muscle cells.
- They have well developed, controlled and coordinated mechanisms.
- They can transmit impulses due to the presence of nerve cells
- Some groups of animals are parasites e.g. tapeworms and roundworms.

14. What is the history of classification?

- Hippocrates, the Father of Medicine, listed organisms with medicinal value.
- Aristotle and Theophrastus classified the plants and animals on the basis of their form and habitat.
- John Ray introduced the term species.
- Carolus Linnaeus organized a simple naming system for plants.
- So, he is known as Father of Taxonomy.
- He developed the Binomial System of nomenclature, which is the current scientific system of naming the species.

15. What are the basic principles of binominal nomenclature?

- Scientific names must be either Latin or Latinized.
- The name of the genus begins with a capital letter.
- The name of the species begins with a small letter.
- When printed, the scientific name is given in italics.
- When written by hand, name should be underlined.

16. Find out the zoological names for the following?

- Cockroach — Periplaneta americana
- Housefly — Musca domestica
- Frog — Rana hexadactyla
- Pigeon — Columba livia
- Man — Homo sapiens

17. What are the botanical names for the following?

- Hibiscus — Hibiscus rosasinensis
- Tomato — Lycopersicon esculentum
- Potato — Solanum tuberosum
- Mango — Mangifera indica
- Rice — Oryza sativa

7. Pictorial Features of Plant Kingdom

1. Give features of Fungi?

- Fungi do not have chlorophyll and cannot prepare their own food.
- All of us would have noticed the sudden growth of mushrooms soon after the rain in humus soil.
- They belong to the kingdom of fungi.
- Fungi is a third kingdom of Whittaker which includes moulds, mushrooms, toadstools, puff balls and bracket fungi.

2. What are the features of fungi?

- They may be unicellular (e.g., Yeast) or multicellular (Rhizopus, Agaricus and Aspergillus)
- They are non- green organisms as they lack chlorophyll.
- Their body is made up of hyphae called mycelium and is covered by cell wall made up of chitin.
- It reproduces by sexual or asexual reproduction.

3. What are the types of fungi?

Based on nutrition, fungi are classified into three types.

● Parasites- Fungi living on other living organisms. e.g., Puccinia.

● Saprophytes- Fungi living on dead and decaying matter. e.g., Agaricus, Rhizopus.

● Symbionts- Fungi (living associated with algae (lichens) or on the roots of higher plants (Mycorrhizae).

4. How are fungi classified normally?

- Zycomycota (Bread Mould)
- Basidiomycota (Agaricus)
- Ascomycota (Toad Stool)
- Deuteromycota (Penicillium)

5. Which is commonly eaten fungi?

Mushroom

6. How can we identify the poisonous mushroom?

Poisonous mushrooms are usually brightly coloured.

7. What is antibiotics?

It is a chemical substance extracted from one living organism to kill or stop the growth of the other living organism.

8. Name some commonly found antibiotics?

Penicilium and other common anitbiotics are Streptomycin, Neomycin, Kanamycin, Gentamycin and Erythromycin

9. Name some fungal disease found in human?

Human- Mycoses (growing on skin, nails, hair, organs), athletes foot, and ringworm.

10. Name some fungal disease found in animals?

Animals - Ergot, athlets foot.

11. Name some fungal disease found on plants?

Plants - Rust, black rot, black spot,canker.

12. What is Claviceps purpuria?

Hallucinogenic fungi cause the greatest damage to the frustrated youth by giving unreal, extra ordinary lightness and hovering sensation.

13. What is Aspergillus?

Aspergillus cause allergy to children while Cladosporium protects against allergy.

14. How are plants classified?

The plants are classified into flowering and non-flowering plants.

15. What is algae?

- They are green water plants called algae. They are lowest and simplest primitive plants. Their body is not differentiated into root, stem or leaf.
- They may be unicellular, multicellular, filamentous or branched and tree like.vegetative reproduction,(fragmentation) e.g. spirogyra Asexual reproduction(Spores)
- They posses chlorophyll and can prepare their own food.
- Their cell wall is made up of cellulose.

16. How are algae classified?

Green, brown, red, blue.

17. What are the uses of algae?

Food

● The following algae are used as food by human being, domestic animals and fishes. e.g., Ulva, Laminaria,Sargassum, Chlorella

2. Agar Agar

- This substance is obtained from the red algae e.g., Gelidium and Gracillaria.
- It is used to make ice creams.
- It is used as culture medium for growing plants in test tubes. (Tissue culture)

3. Iodine

● It is obtained from Laminaria a brown algae.

4. Algae in space travel

● Chlorella pyrenoidosa is used in space travel to get rid of CO2 and other body waste and it also decomposes human urine.

18. What is bryophytes?

The trees and rocks of hilly areas are covered by thick green carpet of tiny plants. They are the first plants to come out of water to get adapted to live on the land. But can reproduce only in the presence of water.

19. How are bryophytes classified?

- Class – Hepaticae Undifferentiated thallus, Protonemal stage absent e.g.,Riccia
- Class – Anthocerotae Sporophyte is differentiated in to seta and capsule Protonemal stage absent e.g. Anthroceros
- Class – Musci Differentiated into root like stem like leaf like organs. e.g. Funaria

20. What is pteridophytes?

The first successful group of cryptogames to live on the land with a vascular system are pteridophytes. They are called vascular cryptogams (xylem and phloem are present in order to conduct water and food). These plants are living since the Jurassic period.

21. How are pteriodophytes classified?

- Psilopsida e.g., Psilotum
- Lycopsida(Club mosses) e.g., Lycopodium
- Sphenopsida(Horsetails) e.g., Equisetum
- Pteropsida e.g., Nephrolepis

22. What is Gymnosperms?

Plant body is differentiated in to root ,stem and leaf. It is Well developed tap root system. Leaves vary in nature, Gymnosperms undergo secondary thickening.

23. What are the classification of gymnosperm?

1. Cycadales:- e.g.,cycas

- Palm like small plants (erect and unbranched)

- Leaves are pinnately compound forming a crown
- Taproot system have coralloid roots

2. Ginkgoales:- e.g., Ginkgo biloba

- It is the only living species of the group
- It is a large tree with fan shaped leaves.
- They produce offensive smell.

3. Coniferales:- e.g., Pinus

- Evergreen trees with cone like appearance
- Needle like leaves or scale leaves
- Seeds are winged

4. Gnetales:- e.g., Gnetum

- Small group of plants with advanced characters
- Ovules are naked present on flower like shoot

24. What is Angiosperms?

Angiosperms are flowering plants which forms one of the major groups of seed plants with at least 2,60,000 living species.

25. What are the classification of angiosperm?

- Monocotyledons
- Dicotyledons

26. What is Monocotyledons?

The plants which have seeds with only one cotyledon are called as monocotyledons. e.g., Grass, Paddy, Maize and Wheat.

27. What is Dicotyledons?

The plants which have the seeds with two cotyledons are called as dicotyledons.

28. What is the structure of root?

● The outer most layer of the root is rhyzodermis. It gives rise to unicellular root hairs.

● The next layer is cortex, helps in conduction and storage.

● The xylem vessels transport water from roots to various parts of the plant.

● The phloem tissues translocates food from leaves to other parts of the plant.

● There is a conjunctive tissue between xylem and phloem.

● Pith is the centre part of the root. It is present in monocot and absent in dicot it helps in storage.

29. What is structure of stem?

● Cuticle - waxy coating

● Epidermis - barrel shaped cells, gives protection and produces multi cellular epidermal hairs

● Cortex- it is divided into three layers.

Collenchyma – thick walled, gives mechanical support.

Chlorenchyma - thin walled, filled with chlorophyll and helps in photosynthesis.

Parenchyma - thin walled, helps in storage and ventilation.

● Endodermis (Starch Sheath) – barrell shaped, helps in protection and conduction.

● Pericycle - parenchyma alternates with sclerenchyma

● Vascular bundle

Phloem - Translocates food

Cambium - secondary growth

Xylem - conducts water

● Medullary ray- extends between vascular bundles

● Pith- helps in conduction

30. What is structure of leaf?

● Cuticle – Outermost layer.

● Upper epidermis – Barrel shaped cells. Helps in protection.

● Vascular bundle - xylem conducts water, phloem translocates food.

● Lower epidermis – barrell shape , have stomata,helps in exchange of gases and transpiration.

● Mesophyll tissue

Palisade parenchyma – cylindrical cells have more choloyphyll and helps in photosynthesis.

Spongy parenchyma – oval or round shaphed with less chlorophyll helps in storage and conduction.

Isobilateral – (either spongy or palisade parenchyma are present) in monocot.

Dorsiventral – (both palisade and spongy parenchyma are present) in dicot.

8. Microorganism

1. What is Microorganism?

Living organisms show a great degree of diversity in their size. A considerable number of species are not visible to the naked eye. They can be seen only with the help of a microscope. Such organisms which can be seen through a microscope are called microorganisms.

2. How are microorganism measured?

They are measured in microns and millimicrons. Example: Virus, bacteria, algae, fungi and protozoan like Amoeba, Plasmodium.

3. What is virus?

Virus is a Latin word which means poison. Viruses are the smallest and simplest of all living organisms.

4. What is virology?

The study of viruses is called Virology.

5. Who discovered virus?

Virus was discovered by Ivanowsky, a Russian Botanist in 1892.

6. What is bacteria in curd?

The curd contains Lacto bacillus bacteria which helps to change the milk into curd.

7. What is bacteriology?

The study of bacteria is called Bacteriology

8. Who observed bacteria first?

Bacteria were first observed under a microscope by the Dutch Scientist Anton Von Leeuwenhoek in 1675.

9. How can we study bacteria?

The structure of bacteria can be studied with the help of an electron microscope.

10. How is bacteria classified based on shape?

Four types of bacteria are recognized based on shape. They are

- Cocci (Spherical shaped)

- Bacilli (Rod shaped)
- Spirillum (Spiral or cork screw)
- Vibrio (Comma Shaped)

11. How is bacteria classified on basis of the number and arrangement of the flagella?

- Monotrichous (Single flagellum at 2. Amphitrichous (Tuft of flagella arising at both ends).
- Atrichous (Without any flagella).
- Lophotrichous (Tuft of flagella at one end).
- Peritrichous (Flagella all around). one end)

12. What is phycology?

The study of algae is called Phycology

13. What is fermentation?

The conversion of sugar solution into alcohol and liberation of carbon dioxide is known as fermentation

14. What is mycology?

The study of fungi is called Mycology.

15. What is mycelium?

A black powdery spot with a network of thread like filaments, called hyphae is called mycelium (bread mould) which changes the colour of the bread.

16. What is protozoa?

Protozoans are unicellular organisms. Metabolic activities are done by organelles. Protozoans show mainly two modes of life, free living and parasitic.

17. Who discovered penicillin?

Alexander Fleming of Britain in 1928 discovered the 'Wonder' Drug Penicillin'.

18. What is antibiotic?

Antimicrobial agents which are useful medicines or drugs and are extracted from the microorganisms. are called antibiotics.

19. What is agriculture?

The science that deals with the growth of plants and animals for human use is called agriculture.

20. What are the bacteria involved in soil fertility?

- Ammonifying bacteria:- e.g., Bacillus ramosus
- Nitrifying bacteria:- e.g.,Nitrobacter Nitrosommonas.

21. Which is good preservative?

Vinegar

22. What is curing?

The leaves of tea, tobacco, the beans of coffee and cocoa are fermented by the activity of Bacillus megaterium to impart the characteristic flavour. This is called curing.

23. What is single cell protein?

Chlorella and Spirulina are used as protein sources. Hence they are known as single cell protein.

24. What is vector?

The method of carrying these disease organisms to the body is varied. The carriers of disease organisms are called vectors. They are said to transmit diseases.

25. What are communicable disease?

Communicable diseases are pathogenic diseases which spread from, person to person, either directly or indirectly.

26. What is the use of Pasteurisation?

Pasteurisaton is used to preserve milk.

27. What is dehydration?

Fish, meat and vegetables with salt can be dried in the sun to reduce the moisture content and the growth of microorganisms. These are dehydrated under controlled conditions.

28. What is social biology?

Social biology is the study of how man lives with other men, with animals and plants and how he affects each of these.

29. What is biological control?

Certain Bacillus species such as B.thuringiensis infect and kill the caterpillars of some butterflies and related insects. Since the bacteria do not infect other animals

or plants they provide an ideal means of controlling many serious crop pests. This control measures is called as Biological control.

30. What is Nature's scavengers?

Saprophytic bacteria and fungi cause decay and decomposition of dead bodies of plants and animals. They release gases and salts to the atmosphere and soil. Hence, the microorganisms like bacteria and fungi are known as Nature's scavengers.

31. What is biological nitrogen fixation?

Many bacteria like Rhizobium, Acetobacter and Clostridium can fix atmospheric nitrogen. This phenomenon is called biological nitrogen fixation.

32. What is Bio - geo cycle?

The cyclic movements of chemicals of Biosphere between the organisms and the environment are referred as Bio - geo cycle.

33. What is Eutrophication.?

Algal bloom leads to loss of species diversity which is known as Eutrophication

34. What is pathology?

Pathology is a science which deals with diseases of plants, animals and human beings caused by viruses, bacteria and fungi.

9. Animal Kingdom

1. What is classification?

The system of sorting living organisms into various groups based on similarities and dissimilarities is called classification.

2. What is taxonomy?

Taxonomy is the branch of biology dealing with identification, description, nomenclature and classification.

3. Who developed a hierarchy of groups for taxonomy?

A Swedish Botanist, Carl Linnaeus (1707-1778) developed a hierarchy of groups for taxonomy.

4. What is hierarchy?

A hierarchy helps to arrange organisms in a sequence according to different levels of similarity.

5. What is kingdom?

The largest group of organisms is the kingdom.

6. What is taxa?

Many sub-groups are formed at various levels and they are arranged in different levels called taxa. The levels of taxa are Kingdom, Phylum, Class, Order, Family, Genus and Species, in descending order.

7. What is species?

The smallest and the most specific group of classification is the species.

8. Who was the first to classify animals?

Aristotle, the father of Zoology, was the first to classify animals based on their similarities and differences. (384-322 BC)

9. Who is the father of modern taxonomy?

Carl Linnaeus, the Swedish Botanist is regarded as the father of modern taxonomy (1707-1778).

10. What is grade of organization?

Animals are grouped as Unicellular or Multicellular based on their number of cells.

11. Which is consider it to be radially symmetrical?

When we look at the shape and structure of an organism and see that body parts are arranged around a central axis in such a way that a flat plane passing through this central axis can divide it into two identical halves, then we can consider it to be radially symmetrical. e.g. Hydra.

12. What is germ layer?

Germ layers are formed during the development of an embryo. These layers give rise to different organs, as the embryo becomes an adult. If an organism has two germ layers, the

ectoderm and the endoderm, it is said to be diploblastic. If they have three germ layers, the ectoderm, the mesoderm and the endoderm, they are triploblastic animals.

13. What is Coelom?

Coelom refers to a fluid-filled cavity inside the body. It separates the digestive tract and other organs from the body wall. A true body cavity or coelom is one that is located within the mesoderm.

14. What is poikilotherms?

Animals can be classified into two groups based on the ability to regulate their body temperature. Some animals like the fish and the frog, have body temperatures that vary with

the temperature of their surroundings. They are called poikilotherms.

15. What is homeotherms?

Creatures like bird and man are called homeotherms because their body temperature remains a constant and is maintained slightly higher than that of the environment.

16. Who created Five Kingdom Classification?

R.H.Whitaker created a Five Kingdom Classification

17. How are animals grouped?

- Phylum Porifera (e.g. Sponges)
- Phylum Coelenterata (e.g. Hydra)
- Phylum Platyhelminthes (e.g. Tapeworm)
- Phylum Aschelminthes (e.g. Ascaris)
- Phylum Annelida (e.g. Earthworm)
- Phylum Arthropoda (e.g. Cockroach)
- Phylum Mollusca (e.g. Snail)
- Phylum Echinodermata (e.g. Starfish)
- Phylum Chordata

18. What is polyps?

Coelenterates are colourful aquatic animals. Members of this group can be found attached and sessile, called polyps; or free-floating as a medusa.

19. What is nematocysts?

Coelenterates have long finger-like structures around the mouth, called tentacles, that are used to catch prey and to protect themselves. The tentacles have special cells called nematocysts.

20. Which is called as farmer`s friend?

Earthworm

21. Which is called as metamerism.?

All annelids are worms .They have elongated, cylindrical and segmented bodies. Each segment carries identical sets of organs. This feature is called metamerism.

22. What are Arthropods?

Arthropods are the largest group in the animal kingdom. It includes crustaceans (e.g.crabs and prawns), insects (e.g.butterflies and cockroaches), arachnids (spiders and scorpions) and myriapods (centipedes and millipedes). The word 'arthropod' means 'jointed foot' and all arthropods have limbs that are made up of jointed segments.

23. Which is the that are invertebrates winged.?

Insects are the only invertebrates that are winged.

24. What is mantle?

The soft, unsegmented bodies without appendages, covered by a thin fleshy structure called mantle. The mantle protects the body by secreting a hard shell made of calcium carbonate.

25. What is Echinodermata?

'Echinos – derma' means 'spiny skinned'. These are marine animals. Their young ones show bilateral symmetry while the adult body show radial symmetry. They are triploblastic and coelomate.

26. Why is Echinodermata considered as unique?

Echinoderms are unique because they have a system of water-filled canals inside the body.

27. Which is the most venomous coelenterate in the world?

The Australian sea wasp or box jellyfish (Chironex fleckeri) is the most venomous coelenterate in the world. It has enough poison to kill about sixty people.

28. What are vertebrates?

The vertebrates are the most advanced group of organisms on the earth. These animals are larger in size than the invertebrates.

29. What is operculum?

Fishes breathe with the help of gills that are protected by a lid-like bony plate called the operculum.

30. How many chambers do amphibian's heart have?

An amphibian's heart has three chambers: two auricles and a single ventricle.

31. Which is homeothermic vertebrates?

Birds are homeothermic vertebrates and have streamlined bodies covered with feathers. They have four limbs.

32. What is Echolocation?

Echolocation, also called bio sonar is used by several animals like bats. These animals emit ultrasound waves and listen to the echoes of those calls that return from various objects in the surroundings.

33. Which is called as homeothermic vertebrates?

Mammals are also homeothermic vertebrates. Their body is covered with hair unlike feathers that we see in birds.

34. What is called as diaphragm?

Mammals have a four-chambered heart. The heart and lungs are separated from the rest of the organs in the abdomen with the help of a muscular sheet called diaphragm.

35. Give note on Vedanthangal Bird Sanctuary?

It is one of the spectacular breeding grounds in India. It is located in Kancheepuram district of Tamilnadu (about 75 km from Chennai). The bird life (domestic and migratory) include Cormarants, Darters, Herons, Egrets, Open billed stork, Spoon bills, White ibis, Little grebe, Blackwinged suits, Grey pelican etc. The ideal season to visit the sanctuary is from November to February.

36. What is reproduction?

Reproduction is the capacity of an organism to produce young ones of their own kind. Living things reproduce to ensure the continuation of their species. All animals have the ability to reproduce.

37. What is the process of reproduction?

The process of reproduction can be asexual or sexual.

38. What is asexual reproduction?

During asexual reproduction, new individuals are formed from a single parent. A single celled organism may simply divide and give rise to independent daughter cells.

39. What is Sexual reproduction?

Sexual reproduction involves the production of sex cells or gametes. The male organism gives rise to male gametes or sperms and the female organism gives rise to the female gametes or the ova.

40. What is zygote?

In sexual reproduction, the male and female gametes fuse together to form a single cell called the zygote. The zygote grows to be a new adult.

41. Which is called as hermaphrodites,?

Bisexual organism, also referred to as hermaphrodites, are those that possess both testis and ovary in the same body.

42. What is conjugation.?

Unicellular organisms like Paramoecium are also known to reproduce sexually. Two Paramecia come together, establish a bridge-like connection and exchange genetic material. Each of them separate and divide independently to give rise to daughter cells. This method of sexual reproduction is called conjugation.

43. What is Fertilization?

Fertilization is the process of fusion of male and female gametes. It can be described as internal or external fertilization based on where it occurs.

44. What is molting?

The periodic shedding of the outer covering is called molting.

45. What is cledoic eggs.?

The eggs have a hard calcareous shell that protects them from dehydration and are called cledoic eggs

46. What is metamorphosis.?

A zygote develops into an embryo and grows to become an adult. In insects, for example butterflies, young ones are in the form of larvae or caterpillars. They do not resemble their parents. These young ones undergo a complete transformation in their form and habit to become an adult. This process is called metamorphosis.

47. What is pupa?

The lifecycle of the butterfly and the silk moth are examples of complete metamorphosis. Their young ones are worm-like and strikingly different from the adults. This caterpillar feeds voraciously on leaves for a few days, increases in size and then enters a resting stage called pupa.

48. What is Molting hormone?

Molting hormones or ecdysone or juvenile hormones are secreted by the neuro secretory cells of the brain and controls moulting in insects.

10. Nutrition in Plants and Animals

1. What is nutrition?

The mode of taking food by an organism and utilizing it by the body is called nutrition.

2. What are the two types of nutrition in organism?

There are two modes of nutrition in organisms. They are autotrophic and heterotrophic nutrition.

3. What is Autotrophic Nutrition?

Green plants are the only organisms which can synthesize food for themselves and also provide food for other organisms including us. The mode of nutrition in which organisms make their own food is called Autotrophic Nutrition and such organisms are called autotrophs.

4. What is Heterotrophic Nutrition?

Non-green plants and most animals (like us) take in readymade food from plants and other animals. The mode of nutrition in which organisms depend on others for their food is called Heterotrophic Nutrition and those organisms are called heterotrophs.

5. What is chlorophyll?

The leaves also have a wonderful green substance called chlorophyll.

6. What is stomata?

The air comes into the leaf through tiny openings named stomata and water moves up from roots below.

7. What is photosynthesis?

The process of preparing food with the help of water, carbon dioxide, sunlight and chlorophyll in plants is called photosynthesis.

8. What is fungi?

They grow on dead organic matter. They produce digestive enzymes on the dead matter and change it into simple nutrients.

9. What is called as saprotrophytes?

Fungi absorb the nutrients in dissolved form (solution) and utilize it. Such a mode of nutrition is called saprotrophytic nutrition and those plants are called saprotrophytes.

10. What is symbionts?

The algae gives food to the fungus and the fungus absorbs water and minerals and gives to algae. Here, both the organisms help mutually. The phenomenon by which two different organisms live together for mutual help is called symbiosis. The organisms are called symbionts.

11. What is holozoic nutrition?

Food contains not only energy but also the raw materials needed for body's growth, maintenance and repair. Mostly animals take in solid food. This mode of nutrition is called holozoic nutrition.

12. What is Ingestion?

The process of taking food into the body is called ingestion. The mode of intake of food differs in different organisms. eg: Butterflies and bees suck the nectar of the flowers. Snakes (Python) and frogs swallow their food. Aquatic animals (Blue Whale) filter feed.

12. What is digestion?

The process of breaking down of complex food into simple food with the help of enzymes is called digestion.

13. What is absorption?

The process by which the digested food passes into the villi of the wall of the intestine is called absorption.

14. What is assimilation?

The ways in which the absorbed food is utilized in cells is called assimilation.

15. What is egestion?

The removal of undigested food through anus is called egestion.

16. What is Amoeba?

Amoeba is a unicellular organism. It lives in the stagnant water bodies. It feeds on microscopic organisms.

17. What are the steps in human digestive system?

This system is made up of mouth, oesophagus, stomach, small intestine, large intestine and anus.

18. What is mouth?

We ingest the food into mouth cavity through mouth. Mouth cavity contains teeth, tongue and salivary glands.

19. What is teeth?

Teeth help us to cut the food into small pieces, chew and grind it.

20. What is salivary gland?

There are three pairs of salivary glands in our mouth. These glands secrete a watery fluid called saliva. It makes the food wet so that we can easily swallow it. It contains an enzyme called amylase which helps in the digestion of starch.

21. What is tongue?

The tongue is an organ of taste. It helps to mix the food with saliva and make it wet. It also helps in rolling and pushing the food while swallowing.

22. What is stomach?

Stomach is a bag-like structure where the food is further digested. The food is churned. Stomach secretes digestive juice called gastric juice which helps to digest food.

23. What is small intestine?

It is a very long tube and is about 7 metre in length. Here the food is mixed with bile juice, pancreatic juice and intestinal juice. These juices help in completing the digestion.

24. What is large intestine?

It is about 1.5 metre in length and helps in absorbing water. It is the place for temporary storage of undigested food. Digestion does not take place here.

25. What is egestion?

The undigested food (faecal matter) is eliminated through anus and the process is called egestion.

26. What is peristalsis?

Food in the digestive system moves from the oesophagus to the anus by rhythmic contraction and expansion of the wall of the digestive system. This movement is called peristalsis.

27. What is milk teeth?

The first set of teeth grows when a baby is about one year old. This set of teeth is called milk teeth. They are 20 in number.

28. What is permanent teeth?

Milk teeth stay in a child up to the age of seven to eight years. When the milk teeth fall off, a new set of teeth grow. They are called permanent teeth. They are thirty-two in number.

29. What are the four types of teeth?

There are four types of teeth. They are incisors, canines, premolars and molars.

30. What is incisors?

These are chisel shaped teeth at the front of the mouth. They are eight in number. Four are present in each jaw. These are used for biting the food.

31. What is Canines?

These are sharp and pointed teeth. They are four in number and two are present in each jaw. Canines are used for cutting and tearing of food.

32. What is Premolars?

These are large teeth behind canines on each side. They have large surface. They are eight in number and four are present in each jaw. They help in chewing and grinding the food.

33. What is molars?

These are very large teeth present just behind the premolars. They have more surface area than premolars. They are used for chewing and grinding of food like premolars. They are twelve in number and six are present in each jaw.

34. What is rumen?

Some grass eating animals such as goat, cow and buffalo they eat grass hurriedly and swallow quickly and store it in the first chamber of the stomach called rumen.

35. What is rumination?

The grass is fermented with the help of certain bacteria and the partially digested grass is called cud. Later, the cud is brought back to the mouth in small quantities and the animal chews it. The process of chewing the cud is called rumination. Animals which chew the cud are called ruminants.

11. Respiration in Plants and Animals

1. What is use of food?

Food contains energy. The food is broken into simpler forms in the alimentary canal. They are then absorbed by the small intestine and carried by the blood to all parts of the body. The energy supply of food is of no use until it is released from the food.

2. What is called as cellular respiration?

The process of oxidation of food to release energy along with water and carbon dioxide as wastes in living cells is called respiration or cellular respiration.

3. What are the types of respiration?

Respiration is of two types: (a) Aerobic respiration and (b) Anaerobic respiration.

4. What is anaerobic respiration?

Some microorganisms like yeast and bacteria obtain energy from food in the absence of oxygen. So, the respiration that takes place in the absence of free oxygen is called anaerobic respiration. Anaerobic respiration takes place in our skeletal muscles.

5. Difference between respiration and breathing?

Breathing	Respiration

It is a physical process because only the air moves from one place to another .	It is a chemical process because the food undergoes chemical changes
Energy is not released.	Energy is released
It takes place in breathing organs.	It takes place in living cells.

6. What is respiration?

Respiration is the process of burning food with the help of oxygen to release energy.

7. What is respiratory system?

The human respiratory system consists of nose, nasal cavity, trachea, bronchi and lungs.

8. What is diaphragm?

Below the lungs is a strong, flat sheet of muscle called the diaphragm.

9. What is nostril?

Our nose has two openings called nostrils.

10. What is bronchi?

Nostrils lead to nasal cavity which in turn leads to trachea (wind pipe). The trachea divides into two branches called bronchi.

11. What is bronchioles?

Each bronchus enters the lungs and divides into small tubes called bronchioles.

12. What is alveoli?

The bronchioles end up in air sacs called alveoli.

13. How do we breathe?

Breathing involves both inhalation and exhalation. It is a continuous process which takes place all the time and throughout the lifespan of organisms. The number of times a man breathes in a minute is called the breathing rate.

14. What is route for running of oxygen?

Nose ->Nasal-> Cavity-> Trachea->Bronchi-> Bronchiole-> Alveoli

15. What is the process of exchange of gas?

When oxygen-rich air reaches the alveoli, oxygen is absorbed by the blood and it combines with the haemoglobin. It is then carried as oxyhaemoglobin to all cells of the body. In the cells, oxygen is used for oxidation of food to release energy along with water and carbon dioxide. This carbon dioxide is absorbed by the blood and is transported to the lungs, where it is exhaled.

16. What is **stomata?**

Plants breathe through tiny pores in the leaves called stomata. Oxygen from the air diffuses into the leaves and carbon dioxide from the leaves diffuses out through **stomata**.

17. What is the process of photosynthesis?

The process of photosynthesis in plants takes place during the day. During this process, carbon-di-oxide is used and oxygen is released.

18. Where is anaerobic respiration process takes place?

In lower organisms like the yeast and the bacteria, anaerobic respiration takes place.

19. Where do the aerobic respiration process taking place?

In higher organisms like plants, aerobic respiration takes place.

12. Structure and Physiological functions of plants

1. What is Physiology?

Physiology involves the study of the physical, chemical and biological functions of plants.

2. What is Cytology or Cell biology?

Cells are the structural and functional units of all living organisms. The study of the structure and function of the cell is called Cytology or Cell biology.

3. How is plant cell made of?

A plant cell is typically rectangular or cube shaped. It has an outer covering called cell wall which protects and gives it shape. A cell membrane, also known as the

plasma membrane, surrounds the cytoplasm and its organelles. The plasma membrane, cytoplasm and the nucleus together are referred to as the protoplast. The cytoplasm carries various cell organelles like endoplasmic reticulum, mitochondria, chloroplast, Golgi bodies and ribosomes.

4. What is tissue?

Groups of cells having a common origin and performing similar functions are called tissues.

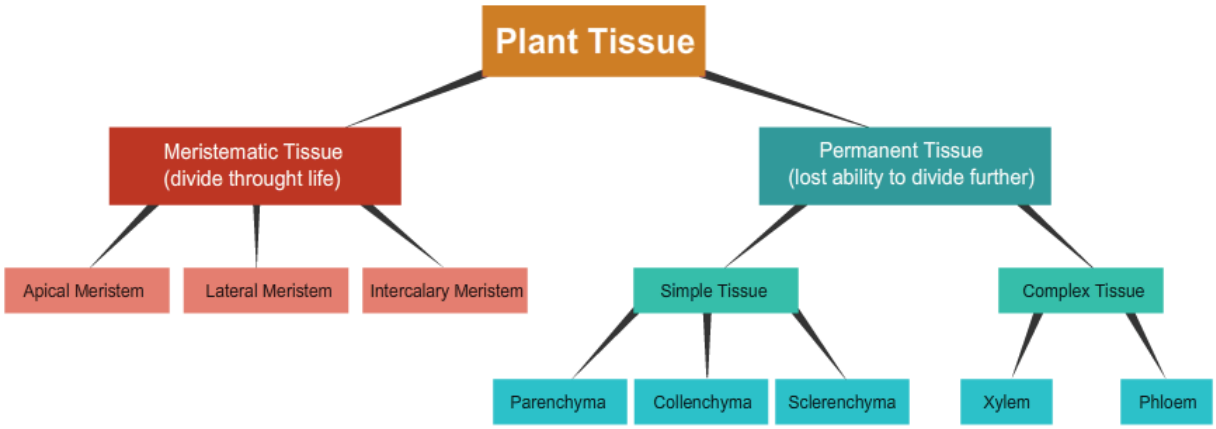
5. What is *nucleus?*

The central dense round body in the centre of the cell is called nucleus.

4. What is cytoplasm?

The substance between the nucleus and cell membrane is called cytoplasm.

5. What is the classification of plant tissue?



6. What is Meristematic Tissues?

The growth of plants occurs only in certain specific regions. This is because the dividing tissue, also known as meristematic tissue (Meristos – divisible), is located only at these points.

7. How is meristematic tissue classified?

They are classified as

- Apical meristem
- Lateral meristem
- Intercalary meritstem

8. What is Apical meristem?

Apical meristem is present at the growing tips of stems and roots and increases the length of the plant body.

9. What is lateral meristem?

This includes the meristematic tissues that occupy the lateral regions of stems and roots.

They bring about increase in the width of the plant body. (e.g. cork cambium and vascular cambium).

10. What is Intercalary meristems?

These meristems occupy the base of leaves and the base of internodal regions in plants such as grasses (mostly in monocotyledonous plants). These help in the elongation of the internodes.

11. What are the Characteristic features of meristematic tissues?

- The meristematic cells may be round, oval, polygonal or rectangular in shape.
- Their cell walls are thin, elastic and made up of cellulose.
- They are closely arranged without any intercellular spaces.
- They have dense cytoplasm with large central nucleus.

12. What are permanent tissue?

They have definite structure and function. They are differentiated into various types according to the different functions they perform.

13. What are the classification of permanent tissue?

- Simple tissues
- Complex tissues

14. What is simple tissue?

A tissue made up of cells having similar structure (one type of cells) and function is called simple tissue. They are of three types:

- Parenchyma
- Collenchyma
- Sclerenchyma

15. What is Parenchyma?

The cells of the parenchyma are generally thin-walled with intercellular spaces. They are living cells. They are present in all the organs of a plant. They may be oval, spherical, rectangular or cylindrical in shape. The cell wall is made of cellulose and pectin.

16. What is Collenchyma?

The cells of collenchyma are polygonal in cross-section and have unevenly thickened walls. These thickenings are due to the deposition of cellulose, hemicelluloses and pectin. The main function of the collenchyma is to provide strength and flexibility to the growing organs like the young stem.

17. What is Sclerenchyma?

Sclerenchyma is a dead tissue. The cells are thick with lignified walls. They give mechanical support to the organs. This has two types of cells-sclereids and fibres.

Sclereids : Sclereids are stone cells which are commonly found in the shells of the nut and pulp of certain fruits such as pear and sapota.

Fibres : Fibres are elongated strands with simple pits throughout its length.

18. What is Complex Tissues?

A tissue that consists of several kinds of cells but all of them function together as single unit is called complex tissue.

19. What is Xylem?

Xylem is mainly concerned with the upward transport of nutrients, water and minerals in the plant body. It forms a continuous tube through the roots, stems, leaves, flowers and fruits by the fusion of elongated cells.

20. What are the different types of cells of xylem?

a. Tracheids

b. Xylem Vessels

c. Xylem Fibres

d. Xylem Parenchyma

21. What is Tracheids?

Tracheids are elongated, tapering cells with blunt ends. They have a lignified secondary wall. They are the chief water conducting elements in Pteridophytes and Gymnosperms.

22. What is Xylem Vessels?

The fibres of sclerenchyma associated with xylem are known as xylem fibres. They give additional mechanical strength to the plant. They are also called as wood fibres.

23. What are XylemParenchyma?

The parenchyma cells associated with xylem are known as xylem parenchyma. It is the only

living cell in the xylem tissue. They store food reserves in the form of starch and fat. They also help in conduction of water.

24. What are the four type of Phloem Tissue?

Phloem conducts food materials from leaves to the other parts of the plant. It is made up of four types of cells:

- Sieve elements
- Companion cells
- Phloem fibres

- Phloem parenchyma

25. What is absorption.?

Plants absorb water and minerals from the soil with the help of root hairs. This process is called absorption.

26. What are the different forces involved in absorption?

The three different forces involved in absorption are:

- Imbibition
- Diffusion
- Osmosis

27. What is passive transport?

When substances move from a region of higher concentration to a region of lower concentration, without the use of metabolic energy, it is said to be passive transport.

28. What is active transport?

Active transport involves the use of metabolic energy for movement of molecules. The uptake of mineral ions is by active transport.

29. What is ascent of sap?

Water, along with mineral salts, are absorbed by the root through its root hairs. The absorbed water reaches the xylem vessels and finally reaches the leaves. This movement of water and mineral salts is known as ascent of sap.

30. What is ‘photosynthesis?

Green plants are autotrophic and synthesize their own food by the process of photosynthesis. 'Photo' means 'light' and 'synthesis' means 'to build'. Thus 'photosynthesis' means 'building up with light'.

31. What are the process of photosynthesis?

The process of photosynthesis occurs in two phases: (i) Light reaction (ii) Dark reaction

32. How do light reaction of photosynthesis occurs?

The reaction involving chlorophyll, solar energy and water that produces ATP (Adenosine

Tri-Phosphate) and NADPH2 (Nicotinamide Adenine Dinucleotide Phosphate-reduced form) is called light reaction.

33. How is photosynthesis taking place in dark reaction?

The reaction in which CO2 is reduced to carbohydrate with the help of ATP and NADPH2 generated during light reaction is called Dark reaction. Light is not required for this reaction. So it is called Dark reaction.

34. What are the functions of leaf?

- *Photosynthesis - Synthesizing carbohydrate using sunlight energy, CO2 and water.*
- *Respiration - Taking in oxygen and giving off CO2.*
- *Transpiration - Giving out excess water as water vapour.*
- *Food Storage - Leaves also serve as organs of food storage in some plants.*
- *Vegetative Reproduction - Buds that can develop into new plants*

35. What is called as transpiration?

Plants absorb a large quantity of water and use only a fraction of it. The excess of water is removed through the aerial parts of the plant such as leaves and green shoots. This is called transpiration.

36. What are the types of transpiration?

There are three types of transpiration:

i) Stomatal transpiration ii) Cuticular transpiration iii) Lenticular transpiration

37. What is stomata?

Stomata are tiny pores on the epidermis of leaves and other aerial parts of the plant like stem.

38. What is guard cell?

Each stoma (singular of 'stomata') is bounded by two kidney shaped cells that control the opening and closing of the pores. These are called guard cells.

39. How is cuticle made of?

The cuticle is made of wax and is very hydrophobic or 'water-repelling'.

40. What is lenticular transpiration?

Lenticels are tiny openings that protrude from the bark in woody stems and twigs as well as in other plant organs. Loss of water through lenticels is called lenticular transpiration and it is a very small percentage compared to stomatal transpiration.

41. What are the Factors Affecting Transpiration?

Light, temperature, wind, quantity of water in the soil, number of stomata and surface area of the leaf are the factors that affect transpiration.

42. What is respiration?

Oxygen combines with glucose to bring about respiration. This process of release of energy from food is called respiration. All the energy required for life processes is respiration.

43. What is ATP?

The energy released during respiration is stored in the form of ATP (Adenosine Tri Phosphate) molecules in the cells and are used by the organism as and when required. ATP is known as the energy currency of the cell.

44. What are the types of respiration?

- Aerobic respiration (Aerobic - with air)
- Anaerobic respiration (Anaerobic - without air)

45. What are the Factors Affecting Respiration?

Oxygen, temperature, water, light, CO2 and glucose are some of the factors that affect respiration.

46. How is transportation taking place in plant?

The transport of materials in a plant can be divided into two parts:

- Transport of water and minerals in the plant.
- Transport of food and other substances like hormones in the plant.

47. What is translocation?

The transport of food from leaves to the other parts of the plant is called translocation.

48. What is sieve tubes.?

The movement of food materials through phloem depends on the action of living cells called sieve tubes.

49. What are the two modes of **PLANT NUTRITION?**

- Autotrophic nutrition
- Heterotrophic nutrition

50. What are autotrophs?

Organisms which are able to synthesize their own food materials are called autotrophs.

51. What are photo autotrophs?

All green plants are photo autotrophs. These are organisms which use energy from sunlight for the synthesis of food. Examples also include some bacteria like green sulphur bacteria, purple sulphur bacteria.

52. What are Chemo Autotrophs?

Organisms which use chemical energy for the synthesis of carbon compounds are called chemo autotrophs. They get energy by oxidizing simple inorganic compounds such as hydrogen, sulphur containing compounds, hydrogen sulphide and ammonia. e.g. Nitrosomonas bacteria.

53. What are heterotrophs?

Some organisms cannot synthesize their own food. They depend on other organisms for their food directly or indirectly. Organisms which are not able to synthesize their own food are called heterotrophs.

54. What are the types of Heterotrophic nutrition?

Heterotrophic nutrition is of two types:

- Saprophytic nutrition
- Parasitic nutrition

55. What are the movements of plants?

Plant movements made in response to external stimuli fall into two main categories:

- Tropic movements
- Nastic movements

56. What is tropism?

Movement in which the direction of stimulus determines the direction of response is called tropism.

57. What is phototropism?

The movement of a plant part in response to light is called phototropism.

58. What is geotropism?

The movement of plant part in response to gravity is called geotropism.

59. What is hydrotropism?

The movement of a plant part in response to water is called hydrotropism

60. What is chemotropism?

The movement of a plant part in response to a chemical stimulus is called chemotropism.

61. What is pulvinus?

When we touch the leaves of mimosa pudica, the leaves fold up. The petiole of mimosa pudica leaves have a padlike swelling at their base. This is called a pulvinus.

13. Cell Structure

1. What is cell?

The human body is also made up of several small units called cells. The Cell is the basic structural and functional unit of all living organisms.

2. What is microscope?

Cells are very minute and cannot be seen with our naked eyes. They can be observed only through a scientific instrument called 'microscope'.

3. Who named Cells?

Robert Hooke named these chambers 'cells' in 1665. In Latin, the word 'cellula' means "a small chamber".

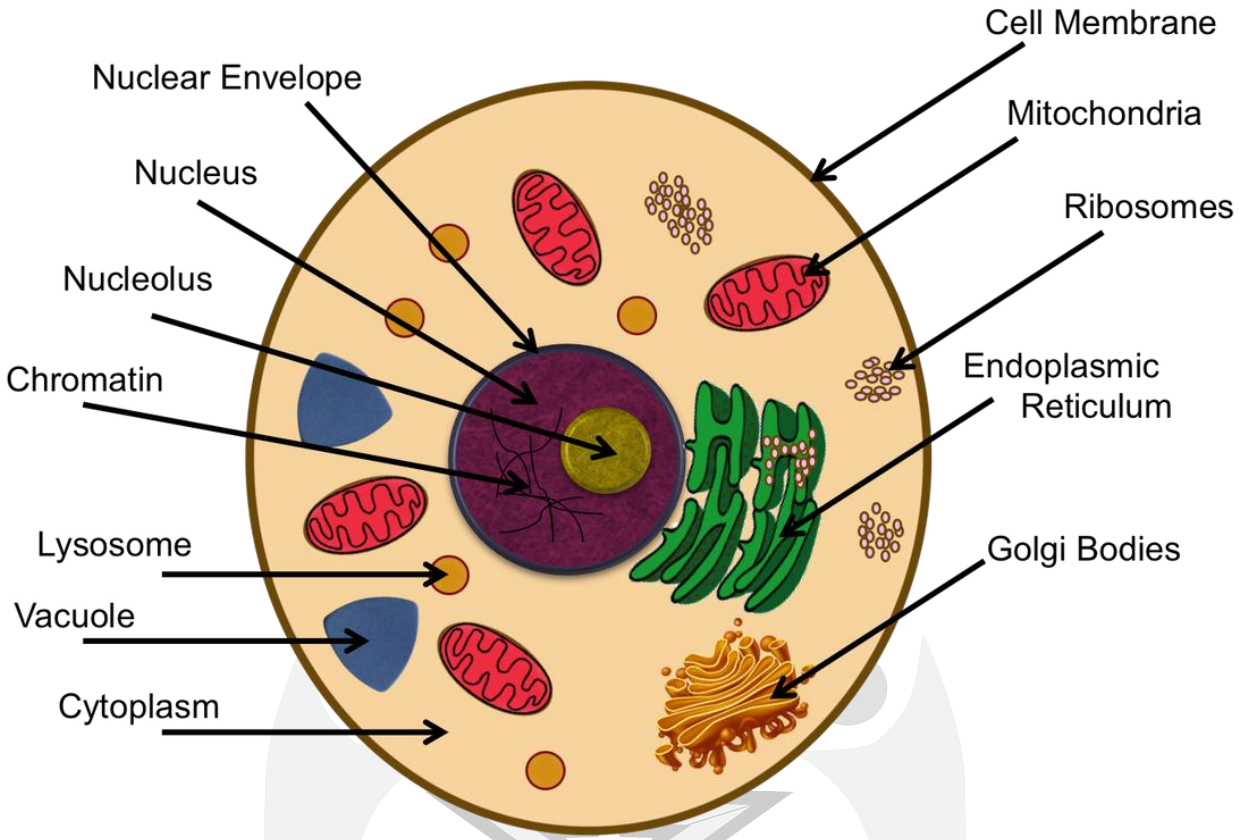
4. What is Prokaryotic cell ?

A cell that does not contain membrane-bound organelles and a well defined nucleus is called a Prokaryotic cell.

5. What is Eukaryotic cell?

A cell that contains a well defined nucleus,a nuclear membrane and membrane-bound cell organelles is called a Eukaryotic cell, i.e. a complete cell. e.g. cells of plants and animals.

6. Name the parts of animal cell?



7. What is plasma membrane?

It is an enveloping the cell. It give shape to the cell. It act as a guard. It control the entry and exit of materials.

8. What is Protoplasm?

It is a colloid, found inside the plasma membrane. It have two components of the cell namely the cytoplasm and the nucleus.

9. Who termed the name protoplasm?

J.E. Purkinjee coined the term protoplasm. 'Proto' means 'first' and 'plasma' means 'colloid'.

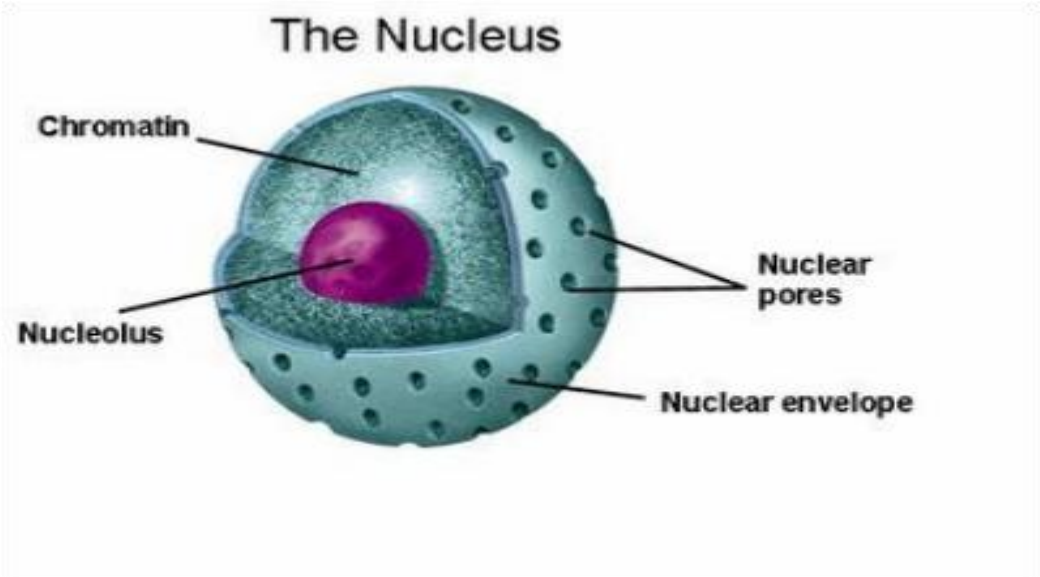
10. What is cytoplasm?

It is located in between the plasma membrane and the nucleus. It is made up of carbohydrates and proteins. Organelles and lipid droplets are present in it.

11. What is Nucleus?

It is the control centre of the cell. It is known as the nucleus. It is spherical in shape. It has the nucleoplasm, the nucleolus and the chromatin reticulum. It is enclosed by the nuclear membrane. It carry the genetic characters from generation to generation.

12. Give names of parts in nucleus



13. Which is called as Powerhouses of the cell?

Mitochondria- (singular - Mitochondrion)

14. What is Endoplasmic reticulum?

It help in transportation of materials from one part of the cell to another.

15. Which is called as Dictyosomes?

Golgi bodies

16. What is called as Protein factories of the cell?

Ribosomes

17. Which is called as Suicidal bags of the cell?

Lysosomes

18. Which helps in formation of new cells?

Centrosome

19. What is cell wall?

It is an outer layer, which gives shape to the cell. It is made up of cellulose. Its function is to protect the inner organelles and to give shape to the cell.

20. How is cell classified based on type pigment and function?

Type	Pigment	Function
Chloroplast	Chlorophyll - green pigment	gives green colour to the stem and leaves
Chromoplast	Carotene - orange pigment Xanthophyll - yellow pigment	gives colour to flowers and fruits

Leucoplast	No pigments - colourless	found in roots and underground stems

21. What is the difference between plant cell and animal cell?

Plant cell	Animal cell
1. Presence of cell wall	Absence of cell wall
2. Presence of plastids	Absence of plastids
3. Centrosome is absent	Centrosome is present
4. Vacuoles are large in size	Vacuoles are small in size

22. What is the function of plasma membrane?

- It gives shape to the cell.
- It selects the substances required by the cell and transports them in and out.
- It controls the movements of substances in and out of the cell.
- It protects the cell.

23. What is the function of cytoplasm?

It distributes the nutrients within the cell.

24. What is the function of nucleus?

- It controls all the activities of the cell.
- It carries the hereditary characters from one generation to another

14. Cells

1. What is cells?

Cells are the smallest functional units in a living organism.

2. What is Prokaryota?

Prokaryota, in Greek means 'before nucleus'. Prokaryotes are organisms that do not have a well developed nucleus or any other structure in their cell that are bound by a membrane.

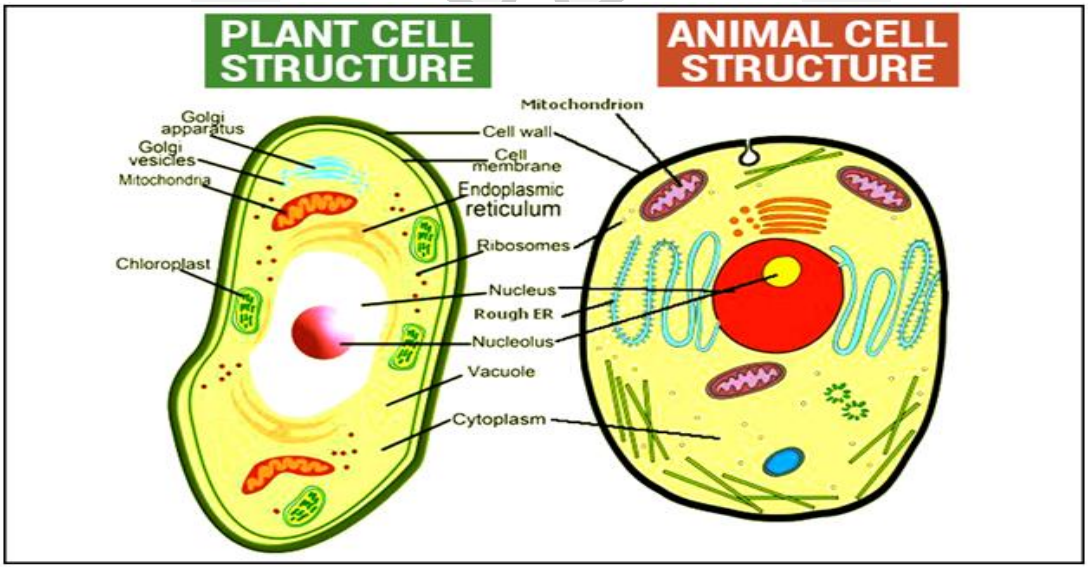
3. What is "eukaryotic cells"?

A eukaryotic cell has a well organized nucleus. It also has structures like endoplasmic reticulum, golgi body, mitochondria, plastids and vacuoles.

4. Difference between **Prokaryotic Cell Eukaryotic Cell?**

Prokaryotic Cell	Eukaryotic Cell
It is generally smaller (1-10 microns) in size.	It is comparatively larger (5-100 microns) in size.
It lacks a well organized nucleus as its nuclear material is not surrounded by a nuclear membrane	It contains a well organized nucleus as its nuclear material is surrounded by a nuclear membrane
It has a single chromosome.	. It has more than one chromosome
Nucleolus is absent.	Nucleolus is present.
It lacks membrane bound cell organelles.	It possesses membrane bound cell Organelles
Cell division occurs by fission or budding. Mitotic and meiotic divisions are absent	Cell division takes place by mitosis and meiosis.
Ribosomes are small.	Ribosomes are large

5. Compare animal and plant cells



7. Differentiate between plant cell and animal cell.

S.No	Animal cell	Plant cell
1.	Animal cells are generally small in size.	Plant cells are larger than animal cells.
2.	Cell wall is absent.	The plasma membrane of plant cells is surrounded by a rigid cell wall of cellulose.
3.	Except the protozoan *Euglena* no animal cell possesses plastids.	Plastids are present.
4.	Vacuoles in animal cells are many and small.	Most mature plant cells have a large central sap vacuole.
5.	Animal cells have a single highly complex Golgi	Plant cells have many simpler units of and prominent Golgi apparatus. apparatus, called dictyosomes.
6.	Animal cells have centrosome and centrioles.	Plant cells lack centrosome and centrioles.

8. What is plasma membrane?

The content of a cell is enclosed by a membrane called plasma membrane. It is found around all living cells. It is so important that it is also considered as an organelle that controls how substances move in and out of a cell. It acts as a barrier and helps the substances inside a cell to remain concentrated. It is made of a bilayer or a double layer of phospholipids in which Cut a small piece of onion and separate a peel. Place the peel on a glass slide in a drop of water. Put a drop of methylene blue on the peel. Wash it in water to remove the excess stain. Put a drop of glycerine and cover it with a coverslip. Observe it

under the microscope. The boundary of the onion peel is the cell membrane covered by another thick covering called cell wall. The central dense round body in the centre is called nucleus. The substance between the nucleus and the cell membrane is called cytoplasm.**CTIVITY 2.**

9. What is the function of plasma membrane?

- It provides an outer boundary to the cell and protects it from injury.
- It controls the substances that are allowed to enter and exit the cell.
- This regulation is called selective permeability.
- This is why a cell membrane is also described as a selectively permeable membrane.
- It allows the flow of materials and information between different organelles of the same cell, as well as between the adjacent cells.

10. What is cell wall?

Cell wall is found around the plasma membrane. It is made of cellulose and lignin. Lignin is water-resistant. The cell wall provides rigidity, protection and support to a plant cell and prevents it from collapsing.

11. What is primary cell wall?

The cell wall in young cells is called primary cell wall. It is much thinner and more elastic than those found in older cells and allows the young cell to grow.

12. What is secondary cell wall?

When a cell stops growing, the primary cell wall becomes thicker and develops a new layer

between it and the plasma membrane. This is called secondary cell wall and it has

more lignin than the primary cell wall.

13. What is cytoplasmic streaming?

Cytoplasm is the jelly-like, translucent, and homogeneous substance that fills up a cell. It is made up mostly of water and a few dissolved ions. It has a network of filaments that suspends the organelles and also maintains the shape of the cell. The cytoplasm also moves around slowly carrying the organelles around in a process called cytoplasmic streaming

14. What is ectoplasm?

The portion of cytoplasm immediately below the cell membrane is gel-like and is called ectoplasm

15. What is endoplasm.?

The cytoplasm between the ectoplasm and the nuclear membrane is liquefied and is called endoplasm.

16. What is protoplasm.?

The cytoplasm together with the nucleus is referred to as the protoplasm.

17. What is ER?

Endoplasmic reticulum (ER) is an interconnecting system of channels and tubules that look like sacs and folds. It is spread throughout the cytoplasm and is continuous with the plasma membrane and nuclear membrane. There are two types of ER : rough and smooth.

18. Who discovered Golgi complex?

Golgi complex was first disovered by Camillo Golgi.

19. What is called as Lysosomes?

Lysosomes are often referred to as ‘suicide bags’ or ‘digestive bags’.

20. What is Vacuoles?

Large fluid-filled sacs called vacuoles are found more in plant cells than in animal cells. Mature plant cells are found to have one large vacuole that almost fills up the entire cell.

21. What is ‘powerhouses of the cell?

Mitochondria’

22. What is plastids?

Plastids, cell wall and large vacuoles are specific characteristics of plant cells. Plastids occur as disc-shaped or ovoid organelles. They may be found as colourless plastids called leucoplasts or coloured ones called chromoplasts.

23. What is structure of chloroplast?

Each chloroplast consists of a double membraned envelope and a matrix. The inner membrane is arranged along the length of the plastids as lamellae. At certain regions, the lamellae are thickened and appear like a pile of coins. These are called the grana. Each granum consists of disc-shaped membranous sacs called thylakoids.

24. What is centrioles?

Centrosome is present in animal cells and in certain lower plants. It is absent in prokaryotic cells and higher plant cells. It is located in the cytoplasm, just outside the nucleus and contains a pair of small, hollow granules called centrioles.

25. What is nucleus?

A nucleus is commonly seen as a spherical structure surrounded by a double membrane called the nuclear envelope.

26. What are the nucleoplasm types of nuclear structures?

The nucleoplasm has two types of nuclear structures: i) the nucleolus ii) the chromatin.

27. What is DNA?

DNA is Deoxy ribonucleic acid

28. What are Chromosomes?

During cell division, chromatin is condensed into thick cord like structures called chromosomes

29. What is kinetochore?

A chromosome can separate itself into two halves called chromatids. When separate, both sister chromatids remain attached to each other at the centromere, also known as the kinetochore

30. What is Chromosomes?

Chromosomes are the tightly coiled strands of genetic material that are visible as chromatin fibres only during cell division

31. What is Metacentric Chromosome?

The centromere lies in the middle of the chromosome and the two arms are almost equal in length. It is a V-shaped chromosome.

32. What is Submetacentric Chromosome?

The centromere lies slightly away from the middle of the chromosome and hence, its one arm is slightly shorter than the other. It is a 'J' shaped chromosome.

33. What is Acrocentric chromosome?

The centromere lies near the end and hence, one arm is very short and the other arm is very long. It is a rod-shaped chromosome.

34. What is Telocentric Chromosome?

The centromere lies at one end of the chromosome and hence, there is only one arm on one side. It is also a rodshaped chromosome.

35. What is DNA?

Chromosomes are made of a long series of structures called genes. Genes are made of a chemical called Deoxyribo Nucleic Acid or DNA.

36. What are the types of nitrogenous bases?

The nitrogenous bases are of two kinds- Purines and Pyrimidines. Adenine and Guanine are the purines and Thymine and Cytosine are the pyrimidines.

37. What are the divisions of cell?

Cells divide by three different methods. They are Amitosis, Mitosis and Meiosis.

38. What is amitosis?

Amitosis is a simple method of cell division. It is also called direct cell division. The nucleus elongates and develops a constriction around its middle. The constriction gradually deepens and finally divides the nucleus into two daughter nuclei.

39. What is meiosis?

Meiosis is a type of cell division which takes place in the reproductive cells of organisms. This results in the formation of gametes.

40. What is Passive transport?

Passive transport happens when a substance moves across a membrane from a region of higher concentration to lower concentration. It does not require any metabolic energy.

41. What is osmosis?

The process by which the water molecules pass through a membrane from a region of higher water concentration to the region of lower water concentration is known as osmosis.

42. What is endosmosis?

The process in which the water molecules enter into the cell is known as endosmosis.

43. What is exosmosis?

The process in which the water molecules move out of the cell is known as exosmosis.

44. What is plasmolysis?

In plant cells, due to excessive exosmosis, the cytoplasm along with the plasma membrane shrinks away from the cell wall. This process is known as plasmolysis.

45. What is pinocytosis?

During phagocytosis substances are taken up in solid form. Cells which involve in this process are called phagocytes and said to be phagocytic. (e.g. white blood cells).

Cells take in liquids continuously through microscopic capillary structures on their cell membranes. This method of transport of substances is called pinocytosis.