1. Life Process

Very Short Answer Type Questions-Pg-23

1. Question

Which is the basic requirement of living organisms for obtaining energy?

Answer

Food is the basic requirement of all living organisms to get energy and to carry out their activities.

2. Question

Which of the following type of energy is used by living organisms to perform vital life processes? Kinetic energy, Chemical energy, Potential energy, nuclear energy

Answer

To perform vital life processes like respiration, chemical energy is used by living organisms.

3. Question

Which of the following is an autotroph?

Green Plant or Man

Answer

Green plants are autotrophs because they can make their food themselves.

4. Question

Name two inorganic substances which are used by autotrophs to make food?

Answer

Inorganic substances such as CO_2 and water are used by autotrophs to synthesize their food.

5. Question

What is the mode of nutrition in fungi?

Answer

Fungi obtain their food from dead and decaying plants and animals. Such type of mode of nutrition is called saprotrophic nutrition.

6. Question

Name one organism each having saprophytic, parasitic and holozoic modes of nutrition.

Answer

Fungi have saprophytic mode of nutrition.

Leech has parasitic mode of nutrition.

Amoeba has holozoic mode of nutrition.

7. Question

Name the process by which plants make food.

Answer

The process by which green plants make their own food is called photosynthesis.

8. Question

In addition to carbon dioxide and water, state two other conditions necessary for the process of photosynthesis to take place.

Answer

In addition to carbon dioxide and water, plants need sunlight and chlorophyll for the process of photosynthesis.

9. Question

Apart from sunlight and chlorophyll, what other things are required to make food by photosynthesis?

Answer

Apart from sunlight and chlorophyll, plants need water and carbon dioxide to make food by the process of photosynthesis.

10 A. Question

Name a gas used in photosynthesis.

Answer

In the process of Photosynthesis, Carbon dioxide gas is used.

10 B. Question

Name a gas produced in photosynthesis

Answer

In the process of Photosynthesis, Oxygen gas is produced.

11. Question

The leaves of a plant first prepare food A by photosynthesis. Food A then gets converted into food B. What are A and B?

Answer

The food prepared in the plant by the process of photosynthesis is glucose (A) then it gets stored in plant leaves in the form of starch (B).

12. Question

Which substance is used to remove chlorophyll from a green leaf during photosynthesis experiments?

Answer

We use the alcohol to remove chlorophyll from the leaves during the photosynthesis experiments.

13. Question

Why do we boil the leaf in alcohol when we are testing it for starch?

Answer

To remove chlorophyll from the leaves, we boil the leaf in alcohol.

14 A. Question

Name the pigment in leaves which absorbs sunlight energy.

Answer

Chlorophyll absorbs the light energy from the sun that is required to derive photosynthesis.

14 B. Question

What is the colour of this pigment?

Answer

The colour of chlorophyll pigment is green.

15. Question

Name the pigment which can absorb solar energy.

Answer

Chloroplast contains a green pigment called chlorophyll. Chlorophyll absorbs the solar energy from the sun and converts it into chemical energy.

16. Question

Name the organelle of plant cells in which photosynthesis occurs.

Answer

Chloroplasts are the plant cell organelles where the process of photosynthesis takes place.

17. Question

Apart from carbon dioxide and water, name four other raw materials which are needed by the plants.

Answer

Apart from carbon dioxide and water, nitrogen, magnesium, iron and phosphorus are needed by the plants. Plants take these raw materials from the soil.

18. Question

Where is chlorophyll mainly present in a plant?

Answer

Chlorophyll is present in the chloroplast and chloroplast is mainly present in the leaves of the plant.

19. Question

What is the name of those cells in the leaf of a plant which control the opening and closing of stomata?

Answer

Each stomata is surrounded by a pair of guard cells. Guard cells regulate the opening and closing of stomata.

20. Question

Name an animal whose process of obtaining food is called phagocytosis.

Answer

The mode of nutrition in amoeba is holozoic and the process of obtaining food is called phagocytosis.

21. Question

All the animals can be divided into three groups on the basis of their eating habits. Name the three groups.

Answer

All animals, on the basis of their food habits, can be divided into three groups:-

• Herbivores

• Carnivores

• Omnivores

22. Question

What is the scientific name of the animals which are:

(i) Only meat eaters?

(ii) Only plant eaters?

(iii) Both, plant and meat eaters?

Answer

(i) The term **carnivore** is related to only flesh eating animals.

(ii) The term **herbivore** is related to only plant eating animals.

(iii) The term **omnivore** is related to both plant and meat eating animals.

23. Question

Name the green pigment present in the leaves of a plant.

Answer

Chlorophyll is the green pigment present in the leaves of plants. It is necessary for the process of photosynthesis in plants.

24. Question

Arrange the following processes involved in the nutrition in animals in the correct order (in which they take place):

Assimilation, Egestion, Ingestion, Absorption, Digestion

Answer

The correct order of processes involved in the nutrition in animals are-

Ingestion, digestion, absorption, assimilation, egestion.

25. Question

How does Amoeba engulf the food particle?

Answer

Amoeba has no mouth for ingestion of food. Amoeba engulfs the food particles by forming finger-like projections called pseudopodia.

26. Question

What substances enter into the food vacuole in Amoeba to break down the food?

Answer

In amoeba, digestive enzyme digests the food in the food vacuole. The enzymes enter into the food vacuole from outer cytoplasm and break down the food into small molecules.

27. Question

From which part of the body, undigested food is egested in Amoeba?

Answer

Amoeba has no fixed place for egestion. When sufficient amount of undigested food gets collected inside the cell, it is thrown out of the body by rupturing the cell membrane.

28. Question

Name a unicellular animal which uses cilia to move food particles into its mouth.

Answer

Paramecium, a unicellular animal, has tiny hair-like structures, called cilia around its body. It uses cilia to sweep the food particles from water into its mouth.

29. Question

Name the enzyme present in human saliva. What type of food material is digested by this enzyme?

Answer

Saliva is a watery fluid which contains an enzyme called salivary amylase. Salivary amylase acts on starch and breaks down it into sugar.

30. Question

Which of the organs perform the following functions in humans?

(i) Absorption of food

(ii) Absorption of water

Answer

(i) The absorption of digested food takes place in the small intestine.

(ii) The absorption of water from remaining indigestible food takes place in the large intestine.

31. Question

What moves the food in the digestive organs?

Answer

Peristaltic movement is the contraction and relaxation of the muscles of the digestive tract to move the food through the digestive system.

32. Question

What is the other name of food pipe?

Answer

Food pipe is also called oesophagus. Oesophagus is a long muscular tube that runs from the mouth to the stomach.

33. Question

What substance is mixed with food in the mouth during chewing by the teeth?

Answer

Salivary glands secrete saliva into the mouth which is mixed with the food. Saliva makes the food slippery so that it is easy to swallow.

34. Question

What is the name of tiny projections on the inner surface of small intestine which help in absorbing the digested food?

Answer

The inner surface of small intestine has numerous finger-like projections called villi. Villi increase the surface area which helps in absorption of the digested food.

35. Question

In which part of the digestive system is water absorbed?

Answer

The walls of the large intestine absorb water from the remaining indigestible food materials.

36. Question

What is the name of the opening in the human body through which undigested food is thrown out?

Answer

Anus is the opening at the end of the alimentary canal through which undigested food is thrown out.

37. Question

Where is digested food absorbed into blood in human body?

Answer

Digested food is absorbed in the small intestine. The digested food passes through the walls of small intestine and goes into our blood stream.

38. Question

Name the biological catalysts which bring about chemical digestion of food.

Answer

Enzymes are biological catalysts which increase the rate of chemical reactions that take place inside the living body. Examples: Pepsin, trypsin, amylase, etc.

39. Question

Fill in the following blanks with suitable words:

(a) All green plants are.....

(b) All non-green plants and animals are .....

(c) Heterotrophs depend on ..... and other ..... for food.

(d) Green plants use ..... and ..... to make food.

(e) Iodine turns blue-black on reacting with .....

Answer

(a) All green plants are **autotrophs**.

(b) All non-green plants and animals are **Heterotrophs**.

(c) Heterotrophs depend on **autotrophs** and other **heterotrophs** for food.

(d) Green plants use **carbon dioxide** and **water** to make food.

(e) Iodine turns blue-black on reacting with **starch**.

Short Answer Type Questions-Pg-25

40 A. Question

What is chlorophyll ? What part does chlorophyll play in photosynthesis?

Answer

Chlorophyll is a green coloured pigment present in the leaves of plants. Chlorophyll absorbs the solar energy from the sunlight during the process of photosynthesis.

40 B. Question

(i) Which simple food is prepared first in the process of photosynthesis ?

(ii) Name the food which gets stored in plant leaves.

Answer

(i) The food prepared in the plant by the process of photosynthesis is in the form of sugar called glucose.

(ii) Extra glucose gets stored in plant leaves in the form of starch.

41 A. Question

What criteria can be used to decide whether something is alive?

Answer

The most important factor that decides whether something is alive is movement.

41 B. Question

What is meant by life processes? Name the basic life processes common to all living organisms which are essential for maintaining life.

Answer

All living organisms perform some basic functions to maintain their lives are called life processes. These life processes are: Nutrition and Respiration, Transportation and Excretion, Control and Co-ordination, Growth, Movement and Reproduction.

42 A. Question

What are autotrophs? Give one example of autotrophs.

Answer

Those organisms which can make their own food from inorganic substances like carbon dioxide and water are called autotrophs. All green plants are the example of autotrophs.

42 A. Question

What are the conditions necessary for autotrophic nutrition?

Answer

Sunlight, chlorophyll, carbon dioxide and water are the necessary conditions required for autotrophic nutrition.

43 A. Question

What are heterotrophs? Give one example of heterotrophs.

Answer

Those organisms which cannot make their own food from inorganic substances like carbon dioxide and water and depend on other organisms for their food are called heterotrophs. All the animals, fungi, and bacteria are examples of heterotrophs.

43 A. Question

What is the difference between autotrophic nutrition and heterotrophic nutrition?

Answer

Autotrophic Nutrition	Heterotrophic Nutrition
In autotrophic nutrition, organisms synthesize their food from inorganic substances like CO_2 and water.	In heterotrophic nutrition, organisms obtain their food directly or indirectly from autotrophs.
Presence of green pigment (Chlorophyll) is necessary.	No pigment is required in this type of nutrition.
Examples: All green plants and some bacteria.	Examples: All animals and fungi.

44 A. Question

Define a nutrient. Name four important nutrients present in our food.

Answer

The nutrient is a chemical substance which is essential for growth and energy for various metabolic activities in living organisms.

Carbohydrates, proteins, fats and minerals are main nutrients present in our body.

44 B. Question

What are the various types of heterotrophic nutrition?

Answer

Heterotrophic mode of nutrition if of three types:

I. Saprotrophic (saprophytic) nutrition

II. Parasitic nutrition

III. Holozoic nutrition

45 A. Question

Photosynthesis converts energy X into energy Y. What are X and Y?

Answer

Photosynthesis is a process in which light energy (X) is converted into chemical energy (Y).

45 B. Question

State the various steps involved in the process of photosynthesis.

Answer

The process of photosynthesis takes place in the following three steps:

• Absorption of light energy by chlorophyll

• Conversion of light energy to chemical energy and splitting of water molecules into hydrogen and oxygen.

• Reduction of carbon dioxide to carbohydrates.

46 A. Question

How do plants obtain food?

Answer

Plants are autotrophs so they can make their own food from inorganic substances like carbon dioxide and water by the process of photosynthesis.

46 B. Question

Why do plants need nitrogen? How do plants' obtain nitrogen?

Answer

Nitrogen is essential element for plants which is used to make proteins and other compounds. Plants take up nitrogen from the soil in the form of inorganic salts called nitrates (or nitrites), or in the form of organic compounds which are prepared by bacteria from the atmospheric nitrogen.

47. Question

Define

(i) saprophytic nutrition

(ii) parasitic nutrition, and

(iii) holozoic nutrition. Give one example of each type.

Answer

(i) Saprophytic Nutrition: Saprophytic nutrition is that nutrition in which organisms obtain their food from dead and decaying organisms (plants and animals).

Examples: Fungi (mushrooms), and many bacteria.

(ii) Parasitic Nutrition: Parasitic nutrition is that nutrition in which organisms obtain their food from other living organisms (called host).

Examples: Leech, mosquito.

(iii) Holozoic Nutrition: In this mode of nutrition, the digestion happens inside the body of the organism. Most of the animals follow this mode of nutrition.

Example: Human beings

48. Question

Define

(i) saprophyte, and

(ii) parasite. Name two saprophytes and two parasite

Answer

(i) Saprophytes obtain their food from dead and decaying organisms. Fungi and many bacteria are examples of saprophytes.

(ii) Parasites live on or in other organisms and obtain their food from them. Leech, mosquito, plasmodium are examples of parasites.

49 A. Question

How does carbon dioxide from the air enter the leaves of a plant to be used in photosynthesis?

Answer

Plants need carbon dioxide for the process of photosynthesis. They take carbon dioxide from the air. Carbon dioxide enters the leaves through tiny pores present on the leaves' surface called stomata.

40 B. Question

How does water from the soil reach the leaves of a plant to be used in photosynthesis?

Answer

Water is important factor required for photosynthesis. Plants take water from the soil through their roots by the process of osmosis. The xylem vessels then transport the water to the leaves where it reaches the chloroplast containing cells and is utilized in photosynthesis.

50. Question

What substances are contained in gastric juice? What are their functions?

Answer

The stomach walls secrete gastric juice which contains three substances: Hydrochloric acid, pepsin enzyme and mucus.

Functions:

(a) Hydrochloric acid kills the germs. It makes acidic medium inside the stomach which is necessary for pepsin enzymes to work.

(b) The enzyme pepsin does partial digestion of protein.

(c) The mucus helps to protect the stomach wall from its own secretions of hydrochloric acid.

51. Question

What substances are contained in pancreatic juice? What are their functions?

Answer

Pancreas secretes pancreatic juice which contains digestive enzymes like pancreatic amylase, trypsin and lipase.

Functions:

(a) Pancreatic amylase breaks down the starch.

(b) Trypsin digests the proteins.

(c) Lipase breaks down emulsified fats.

52 A. Question

What is the role of hydrochloric acid in our stomach?

Answer

Hydrochloric acid makes acidic medium inside the stomach which is necessary for pepsin enzymes to work. In acidic medium, pepsin breaks down proteins into peptones.

Another function of hydrochloric acid is to kill germs that entered the stomach along with food.

52 B. Question

What is the function of enzymes in the digestive system?

Answer

The function of enzymes in the digestive system is to help in the breaking down of complex organic food materials into simpler forms.

53 A. Question

Which part of the body secretes bile ? Where is bile stored? What is the function of bile?

Answer

Bile is a greenish-yellow liquid that is secreted by liver and stored in gall bladder. It contains bile pigments and bile salts.

Functions: The bile performs two functions:

(i) Bile makes acidic food, coming from stomach, alkaline so that pancreatic enzymes act on it.

(ii) Bile salts break down the fat present in the food into smaller globules. This increases the efficiency of enzyme to act and digest the food.

53 B. Question

What is trypsin? What is its function?

Answer

Trypsin is a pancreatic enzyme which is secreted by pancreas. It digests the proteins.

54. Question

What are the functions of liver and pancreas in the human digestive system?

Answer

Liver secretes bile which contains bile pigments and bile salts. Bile helps in the emulsification of fats present in the food.

Pancreas secretes pancreatic juice in the small intestine. Pancreatic juice contains digestive enzymes which help in the digestion of proteins, fats and starch.

55. Question

Match the organisms given in column I with the processes given in column IT:

Column I	Column II
(i) Leech	(a) Holozoic nutrition
(ii) Amoeba	(b) Autotrophic nutrition
(iii) Mushroom	(c) Parasitic nutrition
(iv) Green plant	(d) Saprophytic nutrition

Answer

(i) c (ii) a (iii) d (iv) b

56. Question

Name the following:

(a) The process in plants which converts light energy into chemical energy.

(b) Organisms that cannot prepare their own food.

(c) Organisms that can prepare their own food.

(d) The cell organelle where photosynthesis occurs.

(e) The cells which surround a stomatal pore.

(f) An enzyme secreted by gastric glands in stomach which acts on proteins.

Answer

(a) Photosynthesis is the process by which green plants convert light energy (Sunlight) into chemical energy (Carbohydrates).

(b) Heterotrophs organisms cannot make their own food and depends on other organisms for their food.

(c) Autotrophs organisms can make their own food from carbon dioxide and water.

(d) The process of photosynthesis takes place in Chloroplasts.

(e) A stomata consists a pair of guard cells surrounding a opening called Stomatal pore.

(f) Pepsin is a protein digestive enzyme that is secreted by gastric glands in stomach and breaks down proteins into peptones.

57. Question

Match the terms in column I with those in column II.

Column I	Column II
(i) Trypsin	(a) Liver
(ii) Amylase	(b) Gastric glands
(iii) Bile	(c) Pancreas
(iv) Pepsin	(d) Saliva

Answer

(i) c (ii) d (iii) a (iv) b

58 A. Question

What is common for C uscuta, ticks and leeches?

Answer

All are parasites because they derive their food from other living organisms without killing them.

58 B. Question

Name the substances on which the following enzymes act in the human digestive system :

(i) Trypsin (ii) Amylase

(iii) Pepsin (iv) Lipase

Answer

(b) -

(i) Trypsin is a pancreatic enzyme which digests protein into amino acids.

(ii) Amylase acts on carbohydrates (starch) and converts it into sucrose.

(iii) Pepsin is a digestive enzyme which digests the proteins and converts them into smaller molecules.

(iv) The enzyme lipase digests fat into fatty acids and glycerol.

58 C. Question

Why does absorption of digested food occur mainly in the small intestine?

Answer

The inner surface of small intestine has numerous finger-like structures, called Villi. Villi increase the surface area of small intestine so that optimal

absorption takes place.

59 A. Question

Why is small intestine in herbivores longer than in carnivores?

Answer

Cellulose is a carbohydrate that is digested with difficulty. Herbivores animals like cow, ox, and buffalo that eat only plants (grass) have a longer small intestine to allow the cellulose, present in the plants to be digested completely.

59 B. Question

What will happen if mucus is not secreted by the gastric glands?

Answer

The mucus helps to protect the stomach wall from the secretion of hydrochloric acid. If mucus is not secreted by gastric glands, hydrochloric acid will cause the erosion of inner lining of stomach leading to the formation of ulcers in the stomach.

59 C. Question

What causes movement of food inside the alimentary canal?

Answer

The contraction and expansion movements of the oesophagus called peristaltic movements push the food down inside the alimentary canal.

60 A. Question

How do guard cells regulate opening and closing of stomatal pores?

Answer

The guard cells regulate the opening and closing of stomatal pores. They swell, when water flows into the guard cells and stomatal pores get opens. Similarly, when the guard cells lose water, they shrink, become straight and the stomatal pores get closed.

60 B. Question

Two similar green plants are kept separately in oxygen free containers, one in dark and the other in continuous light. Which one will live longer? Give reasons.

Answer

Plant which is placed in continuous light will live longer because it can do the process of photosynthesis by using light and produce oxygen which is

required for the respiration. While plant which is placed in dark does not do the process of photosynthesis due to lack of light.

61 A. Question

What would happen if all the green plants disappear from the earth?

Answer

Green plants are the source of food for all living organisms. So, if all the green plants disappear from the earth, then all the organisms will die because of starvation.

61 B. Question

If a plant is releasing carbon dioxide and taking in oxygen during the day, does it mean that there is no photosynthesis occurring? Justify your answer.

Answer

If plant is releasing CO_2 and taking in O_2, it doesn't mean that no photosynthesis is happening in the plant. In day time, plants perform both respiration and photosynthesis simultaneously. Plants use up all carbon dioxide released by respiration in the process of photosynthesis. Similarly, some of the oxygen produced during photosynthesis is used up in respiration.

62 A. Question

Leaves of a healthy potted plant were coated with vaseline. Will this plant remain healthy for long? Give reason for your answer.

Answer

The plant whose leaves are coated with vaseline will not remain healthy for long because vaseline will make a coating on the leaves. This will close the stomata due to which plant will stop exchange of gases and transpiration. This plant won't be able to get carbon dioxide for photosynthesis. Thus, the plant will not be able to prepare its food. As a result, plant will die.

62 B. Question

What will happen to the rate of photosynthesis in a plant under the following circumstances?

(i) cloudy day in morning but bright sunshine in the afternoon

(ii) no rainfall in the area for a considerable time.

(iii) gathering of dust on the leaves

Answer

(i) The rate of photosynthesis decreases in cloudy day in morning but increases in bright sunshine in the afternoon.

(ii) The rate of photosynthesis decreases in the area where there is no rainfall for a considerable time.

(iii) The rate of photosynthesis decreases when dust gathers on the leaves.

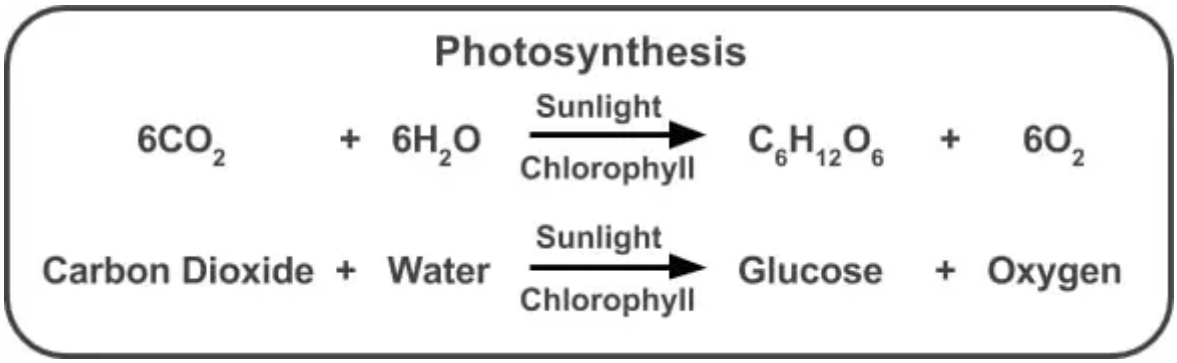
Long Answer Type Questions-Pg-26

63 A. Question

What is photosynthesis?

Answer

The process by which green plants make their food in the presence of sunlight and chlorophyll with the help of inorganic substances like carbon dioxide and water, is called photosynthesis.



63 B. Question

Write a chemical equation to show the process of photosynthesis in plants.

Answer

The process of photosynthesis can be represented as:

$$\underset{\text{Carbon dioxide (From air)}}{6CO_2} + \underset{\text{Water (From soil)}}{12H_2O} + \xrightarrow[\text{Sunlight}]{\text{Chlorophyll}} \underset{\text{Glucose (A food)}}{C_6H_{12}O_6} + \underset{\text{Oxygen}}{6O_2} + 6H_2O$$

63 C. Question

Explain the mechanism of photosynthesis.

Answer

The process of photosynthesis takes place in the green leaves of a plant. Plants need carbon dioxide and water for the process of photosynthesis. Plants take carbon dioxide from the air. Carbon dioxide enters the leaves through tiny pores present on the leaves' surface called stomata. Plants take water from the soil through their roots by the process of osmosis. The xylem vessels then transport the water to the leaves where it reaches the chloroplast containing cells and is utilized in photosynthesis. The process of photosynthesis takes place in the presence of sunlight. The sunlight provides energy required to carry out the chemical reactions involved in the

preparation of food. This sunlight energy is absorbed by the green pigment called chlorophyll. The process of photosynthesis takes place in the following three steps:

• Absorption of light energy by chlorophyll

• Conversion of light energy to chemical energy and splitting of water molecules into hydrogen and oxygen.

• Reduction of carbon dioxide to carbohydrates.

64 A. Question

Name the raw materials required for photosynthesis. How do plants obtain these raw materials?

Answer

The raw materials for photosynthesis are carbon dioxide and water. Plants need carbon dioxide and water for the process of photosynthesis. Plants take carbon dioxide from the air. Carbon dioxide enters the leaves through tiny pores present on the leaves' surface called stomata. Plants take water from the soil through their roots by the process of osmosis. The xylem vessels then transport the water to the leaves where it reaches the chloroplast containing cells and is utilized in photosynthesis.

64 B. Question

What are the various conditions necessary for photosynthesis ?

Answer

Sunlight, chlorophyll, carbon dioxide and water are the necessary conditions required for photosynthesis.

64 C. Question

Name the various factors which affect the rate of photosynthesis in plants.

Answer

The rate of photosynthesis is affected by:

•Light

•Carbon dioxide

•Water

•Temperature

•Mineral elements

65 A. Question

Define nutrition. Why is nutrition necessary for an organism?

Answer

Nutrition is a physical process by which living organisms obtain raw materials (nutrients) to sustain their life. Carbohydrates, fats, proteins, minerals, vitamins and water are examples of nutrients which organisms obtain from their surroundings. Nutrition is necessary for organisms as it provides energy to them for metabolic activities, growth and tissue repair.

65 B. Question

What are the different modes of nutrition? Explain with one example of each mode of nutrition.

Answer

There are mainly two modes of nutrition:

(i) Autotrophic Nutrition

(ii) Heterotrophic Nutrition

(i) Autotrophic Nutrition: Autotrophic nutrition is that mode of nutrition in which organisms prepare their own food from inorganic substances like carbon dioxide and water in the presence of sunlight and chlorophyll. All green plants obtain their food by autotrophic nutrition.

(ii) Heterotrophic nutrition: Heterotrophic nutrition is that mode of nutrition in which organisms cannot prepare their own food from inorganic substances like carbon dioxide and water and depend on other organisms for their food. All the animals, fungi, and bacteria have heterotrophic mode of nutrition.

65 C. Question

Name the mode of nutrition in

(i) roundworm, and (ii) Plasmodium.

Answer

The mode of nutrition in (i) round worm and (ii) plasmodium is parasitic nutrition. Parasitic nutrition is that nutrition in which organisms obtain their food from other living organisms (called host).

66 A. Question

What are herbivores, carnivores and omnivores ? Give two examples of each.

Answer

(i) Herbivores: Animals which eat only plants or their parts like grass, leaves, frutis, etc are called herbivores. Cow, goat, dear, camel are examples of herbivorus animals.

(ii) Carnivores: Animals which eat only flesh of other animlas are called carnivores. Tiger and lion are examples of carnivores.

(iii) Omnivores: Animals that eat both plants and animals are known as omnivores. Example: Human being, crow, dog, sparrow, etc.

66 B. Question

Classify the following into herbivores, carnivores and omnivores: Lion, Man, Dog, Goat, Crow, Elephant, Snake, Hawk, Rabbit, Deer

Answer

Herbivores Carnivores Omnivores

Goat Lion Man

Elephant Snake Dog

Rabbit Hawk Crow

Deer

66 C. Question

Name the five steps which occur in the process of nutrition in animals.

Answer

There are five steps in the process of nutriton in Animals:

(i) Ingestion: It is the process of taking in food.

(ii) Digestion: The process of breaking complex food substances into simple molecules.

(iii) Absorption: It is the process of absorption of digested food.

(iv) Assimilation: It is the process of utilization of digested food; for energy, growth and repair.

(v) Egestion: It is the process of throwing out faecal matter out of the body

67 A. Question

Describe the process of nutrition in Amoeba. Draw labelled diagrams to show the various steps in the nutrition in Amoeba.

Answer

Nutrition in amoeba

Nutrition in amoeba involves the following steps-

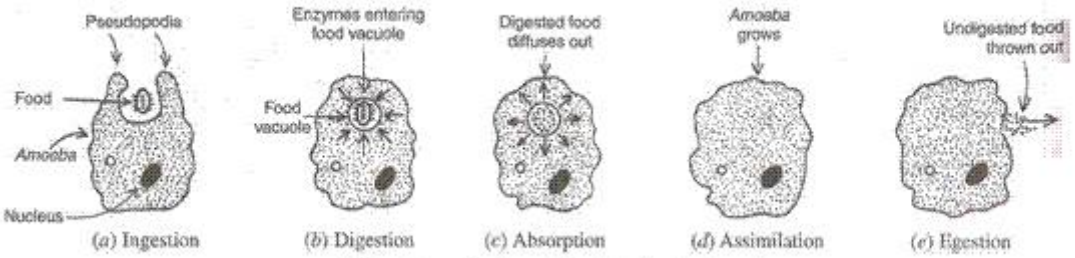
(i) **Ingestion**: Amoeba is a unicellular organism which feeds on microscopic plants and animals which flowt on water. The mode of nutrition in Amoeba is holozoic. Amoeba has no mouth for ingestion of food. It ingests the food by using finger-like extension of cell surface called pseudopodia. The food is engulfed with little water to form a food vacuole.

(ii) **Digestion**: The food is digested in the food vacuole by digestive enzymes which break down the food into small and soluble molecules by chemical reactions.

(iii) **Absorption**: The digested food, present in the food vacuole is absorbed directly into the cytoplasm by diffusion. The digested food spreads out from the food vacuole into the whole amoeba cell. After absorption, the food vacuole shrinks and disappears.

(iv) **Assimilation**: In this step, the absorbed food is used to obtain energy through respiration and other metabolic activities which lead to the growth of Amoeba.

(v) **Egestion**: Amoeba has no particular point from which the egestion takes place. When considerable amount of undigested food collects inside the cell, then its cell membrane ruptures at any place. Through this, the undigested food is thrown out of the body.



Different stages in the nutrition (feeding) of *Amoeba*.

67 B. Question

What is the mode of nutrition in Amoeba known as?

Answer

The mode of nutrition in Amoeba is Holozoic.

67 C. Question

What is the process of obtaining food by Amoeba called? What does it mean?

Answer

The process by which Amoeba obtains food is called phagocytosis which means cell feeding.

68 A. Question

Draw a labelled diagram of the human digestive system. With the help of this diagram, describe the process of digestion of food in man (humans).

Answer

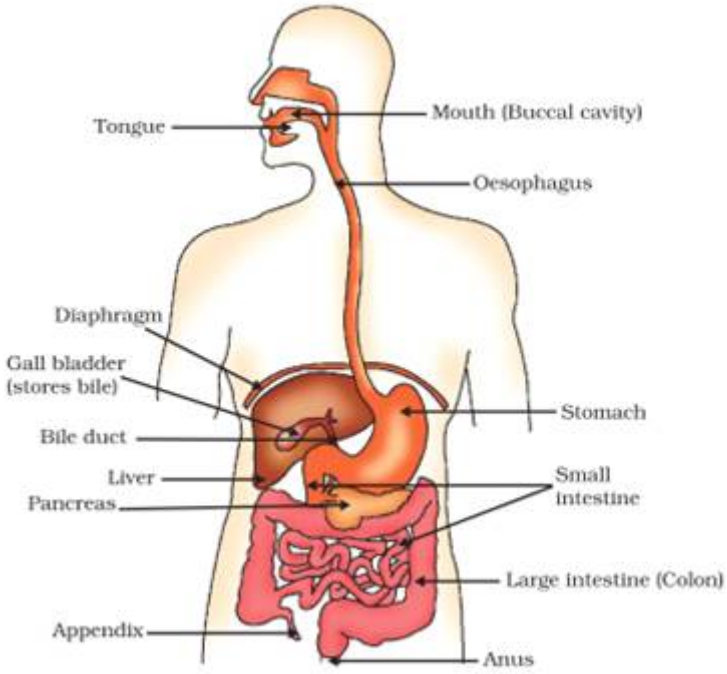
Digestion of food in the human beings:

In human beings, digestion of food starts from the mouth. Mouth opens into a chamber or cavity called buccal cavity. The buccal cavity contains teeth, tongue and salivary glands. The teeth cut the food into small pieces, chew and grind it. Thus, teeth help in physical digestion. Salivary glands produce saliva which mixes with the food. Saliva is a watery fluid that makes the food slippery for swallowing. These glands help in chemical digestion of food.

The saliva contains an enzyme called salivary amylase which digests the starch into maltose sugar. Buccal cavity opens into pharynx which leads to a long tube called oesophagus. The walls of oesophagus are highly muscular. Digestion does not occur in the oesophagus. It carries the food down into the stomach. When the slightly digested food enters the oesophagus, its walls starts contraction and expansion movements called peristaltic movements. These movements push the food from the oesophagus into the stomach.

The glands present on the walls of the stomach secrete gastric juice that contains three substances: hydrochloric acid, the protein digesting-enzyme, called pepsin and mucus. Hydrochloric acid makes acidic medium inside the stomach which is necessary for pepsin enzymes to work. In acidic medium, pepsin breaks down proteins into peptones. Another function of hydrochloric acid is to kill germs that entered the stomach along with food. The mucus helps to protect the stomach wall from its own secretions of hydrochloric acid.

From the stomach, the partially digested food goes into the small intestine through sphincter muscle. In humans, small intestine is the site of complete digestion of food like carbohydrates, proteins and fats. It receives the secretions of two glands, liver and pancreas through a common duct. Liver secretes bile which is alkaline and contains bile salts and bile pigments. Bile salts helps to emulsify the fats. The bile secreted by the liver is stored in the gall bladder. Pancreas secretes pancreatic juice which contains trypsin, lipase and pancreatic amylase. Trypsin digests the proteins, lipase emulsifies the fats and pancreatic amylase breaks down the starch. The wall of small intestine contains glands which secrete intestinal juice. Intestinal juice contains a number of enzyme which complete the digestion process.



Human Digestive System

68 B. Question

Describe one way in which the small intestine is adapted for the absorption of digested food.

Answer

The inner surface of small intestine has numerous finger-like structures, called Villi. Villi increase the surface area of small intestine so that optimal absorption takes place.

68 C. Question

What is the special name of the contraction and expansion movement which pushes the food further in our digestive tract (or alimentary canal) ?

Answer

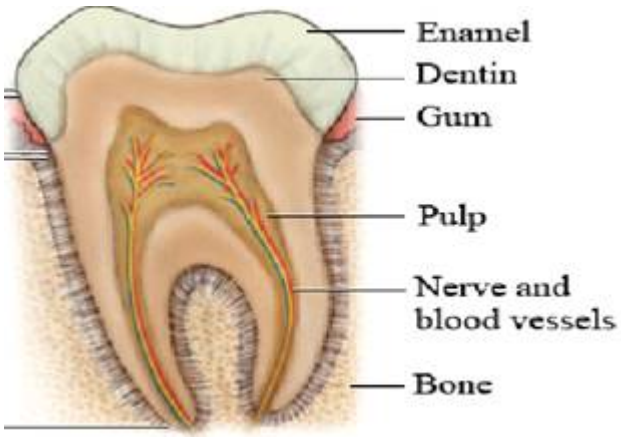
Peristaltic movements.

69 A. Question

Describe the parts of our tooth with the help of a labelled diagram.

Answer

Teeth help us to cut the food into small pieces, chew and grind. The outermost part of the tooth is enamel. Enamel is the hardest tissue in the body. Below the enamel is dentin which surrounds the pulp cavity. The pulp cavity contains nerves and blood vessels.



69 B. Question

What is meant by dental carie ? How are they caused?

Answer

Dental caries is tooth decay which is caused by the action of acid forming bacteria and improper dental care. It is most common form of oral disease.

It generally happens when we eat sugary food. Such food, when acted upon by the bacteria in the mouth, produces acids. The acids, thus produced, lead the loss of calcium and phosphate from the enamel and, subsequently, from the dentine which leads to cavities in the tooth.

69 C. Question

What is dental plaque? What harm can it do? How can the formation of plaque be prevented?

Answer

Plaque is the sticky, yellowish film of bacteria and food particles that forms on the teeth. It is most noticeable when teeth are not brushed. It causes tooth decay.

To prevent plaque, teeth must be brushed twice a day.

70 A. Question

Name the main organs of the human digestive system. Also name the associated glands.

Answer

The various organs of the human digestive system in sequence are: Mouth, Oesophagus, Stomach, Small intestine and Large intestine.

The glands which are associated with the human digestive system are: Salivary glands, Liver and Pancreas.

70 B. Question

How do carbohydrates, fats and proteins get digested in human beings?

Answer

(i) Carbohydrates - The digestion of carbohydrates occurs in the mouth, stomach and small intestine. In the mouth, saliva mixes with the food. Saliva contains an enzyme called salivary amylase which partially digests the carbohydrate and converts it into maltose sugar. When the slightly digested food reaches into the small intestine, pancreatic amylase present in the pancreatic juice breaks down the starch. The walls of the small intestine secrete the intestinal juice which finally converts it into glucose and completes the digestion of carbohydrates.

(ii) Fats - The digestion of fats begins in the stomach. In the stomach, gastric glands secrete a small amount of gastric lipase that breaks down the fats present in the food. In the small intestine, the pancreatic lipase breaks down the emulsified fats. The intestinal juice, secreted by the walls of small intestine, finally converts the fats into fatty acids and glycerol.

(iii) Proteins - The digestion of proteins begins in the stomach. In the stomach, gastric glands secrete gastric juice which contains an enzyme called pepsin which converts the proteins into peptones. Pancreatic juice contains trypsin which digests the proteins into peptides and the intestinal juice completes the process of digestion of proteins thus converting it into amino acids.

Multiple Choice Questions (MCQs)-Pg-27

71. Question

Which of the following has the longest small intestine ?

A. carnivore B. omnivore

C. herbivore D. autotroph

Answer

Herbivores animals like cow, ox, and buffalo that eat only plants (grass) have a longer small intestine to allow the cellulose, present in the plants to be digested completely.

72. Question

The process of obtaining food by Amoeba is known as:

A. dialysis B. cytokinesis

C. phagocytosis D. amoebiasis

Answer

Amoeba is a unicellular organism which float on water. The process of obtaining food by Amoeba is called phagocytosis.

73. Question

The organism having parasitic mode of nutrition is:

A. Penicillium B. Plasmodium

C. Paramecium D. Parrot

Answer

Plasmodium obtains food by parasitic nutrition. Parasitic nutrition is that nutrition in which organisms obtain their food from other living organisms (called host).

74. Question

One of the following organisms has a saprophytic mode of nutrition. This organism is:

A. mushroom

B. malarial parasite has a saprophytic mode of nutrition.

C. leech

D. lice

Answer

Mushroom has a saprophytic mode of nutrition as it obtain its food from dead and decaying organic matter.

75. Question

The length of small intestine in a human adult is about:

A. 4.5 m

B. 1.5 m

C. 3.5 m

D. 6.5 m

Answer

The small intestine is the largest part of the alimentary canal. It is about 6.5 m long. Small intestine is a highly-coiled tube.

76. Question

The process of digestion of food in humans begins in:

A. stomach

B. food pipe

C. mouth

D. small intestine

Answer

Digestion of food begins in the mouth. The mouth cavity contains teeth, tongue and salivary glands. The teeth cut the food into small pieces, chew and grind it. This is called physical digestion.

77. Question

The process of digestion in humans is completed in:

A. oesophagus

B. small intestine

C. stomach

D. large intestine

Answer

The small intestine in the human is the site of complete digestion of food materials like carbohydrates, proteins and fats. It receives secretion of liver and pancreas for this purpose.

78. Question

In human digestive system, bile is secreted by:

A. pancreas

B. liver

C. kidneys

D. stomach

Answer

Bile is a greenish-yellow liquid that is secreted by liver and stored in gall bladder. It contains bile pigments and bile salts.

79. Question

Two of the following organisms have a holozoic mode of nutrition. These organisms are:

A. Paramecium and Plasmodium

B. Plasmodium and Parakeet

C. Parakeet and Paramecium

D. Paramecium and Parasite

Answer

Holozoic mode of nutrition is found in Parakeet and Paramecium.

80. Question

The autotrophic mode of nutrition requires:

A. carbon dioxide and water

B. chlorophyll

C. sunlight

D. all of the above

Answer

Sunlight, chlorophyll, carbon dioxide and water are the necessary conditions required for autotrophic nutrition.

81. Question

The correct order of steps occurring in nutrition in animals is :

A. Ingestion $\rightarrow$ Absorption $\rightarrow$ Digestion $\rightarrow$ Assimilation $\rightarrow$ Egestion

B. Ingestion $\rightarrow$ Digestion $\rightarrow$ Assimilation $\rightarrow$ Absorption $\rightarrow$ Egestion

C. Ingestion $\rightarrow$ Digestion $\rightarrow$ Absorption $\rightarrow$ Assimilation $\rightarrow$ Egestion

D. Ingestion $\rightarrow$ Assimilation $\rightarrow$ Digestion $\rightarrow$ Absorption $\rightarrow$ Egestion

Answer

There are five steps in the process of nutrition in Amoeba:

(i) Ingestion: It is the process of taking in food.

(ii) Digestion: The process of breaking complex food substances into simple molecules.

(iii) Absorption: It is the process of absorption of digested food.

(iv) Assimilation: It is the process of utilization of digested food; for energy, growth and repair.

(v) Egestion: It is the process of throwing out faecal matter out of the body

82. Question

In human digestive system, the enzymes pepsin and trypsin are secreted respectively by :

A. pancreas and liver

B. stomach and salivary glands

C. pancreas and gall bladder

D. stomach and pancreas

Answer

In human digestive system, the enzymes pepsin and trypsin are secreted stomach and pancreas respectively.

83. Question

When carrying out the starch test on a leaf, why is it important to boil the leaf in alcohol ?

A. to dissolve the waxy cuticle

B. to make the cells more permeable to iodine solution

C. to remove the chlorophyll

D. to stop chemical reactions in the cells.

Answer

We use the alcohol to remove chlorophyll from the leaves during the photosynthesis experiments.

84. Question

Pancreatic juice contains enzymes which digest :

A. proteins and carbohydrates only

B. proteins and fats only

C. fats and carbohydrates only

D. proteins, fats and carbohydrates

Answer

Pancreas secretes pancreatic juice which contains trypsin, lipase and pancreatic amylase. Trypsin digests the proteins, lipase emulsifies the fats and pancreatic amylase breaks down the starch.

85. Question

Which of the following is the correct statement regarding bile?

A. secreted by bile duct and stored in liver B. secreted by gall bladder and stored in liver

C. secreted by liver and stored in bile duct D. secreted by liver and stored in gall bladder

Answer

The bile secreted by the liver is stored in the gall bladder. Bile contains bile salts and bile pigments.

86. Question

Where are proteins first digested in the alimentary canal?

A. small intestine

B. oesophagus

C. mouth

D. stomach

Answer

The digestion of proteins starts in the stomach. The glands present on the walls of the stomach secrete gastric juice that contains an enzyme called pepsin. Pepsin breaks down proteins into peptones.

87. Question

The inner lining of stomach is protected by one of the following from the harmful effect of hydrochloric acid. This is:

A. pepsin

B. mucus

C. saliva

D. bile

Answer

The mucus helps to protect the stomach wall from its own secretions of hydrochloric acid.

88. Question

Which part of alimentary canal receives bile from the liver ?

A. oesophagus

B. small intestine

C. stomach

D. large intestine

Answer

In humans, small intestine is the site of complete digestion of food like carbohydrates, proteins and fats. It receives the secretions of two glands, liver and pancreas through a common duct.

89. Question

Which of the following component of our food is digested by an enzyme which is present in saliva as well as in pancreatic juice?

A. proteins B. fat

C. minerals D. carbohydrate

Answer

The digestion of carbohydrates begins in the mouth, stomach and small intestine. Saliva contains an enzyme called salivary amylase which partially digests the starch and converts it into maltose sugar. When the slightly digested food reaches into the small intestine, pancreatic amylase present in the pancreatic juice breaks down the starch.

90. Question

If the saliva is lacking in salivary amylase, then which of the following processes taking place in the buccal cavity will be affected?

A. proteins breaking down into amino acids B. starch breaking down into sugars

C. fats breaking down into fatty acids and glycerol

D. intestinal layer breaking down leading to ulcers

Answer

In the mouth, salivary glands secrete saliva. Saliva is a watery fluid which contains an enzyme called salivary amylase which partially digests the starch and converts it into maltose sugar.

91. Question

Which of the following are the correct functions of two components of pancreatic juice trypsin and lipase?

A. trypsin digests proteins and lipase carbohydrates

B. trypsin digests emulsified fats and lipase proteins

C. trypsin digests starch and lipase fats

D. trypsin digests proteins and lipase emulsified fats

Answer

Pancreas secretes pancreatic juice which contains trypsin, lipase and pancreatic amylase. Trypsin digests the proteins, lipase emulsifies the fats and pancreatic amylase breaks down the starch.

92. Question

The oxygen liberated during photosynthesis by green plants comes from :

A. glucose B. water

C. carbon dioxide D. chlorophyll

Answer

The oxygen liberated during photosynthesis by green plants comes from water.

93. Question

Which of the following is an incorrect statement?

A. energy is essential for life processes

B. organisms grow with time

C. movement of molecules does not take place among cells

D. organisms must repair and maintain their body

Answer

All living organisms are made up of cells. Similarly, the organization of cells into tissue, tissue into organs and organs into systems is dependent upon the movement of molecules.

94. Question

The internal energy (cellular energy) reserve in autotrophs is:

A. proteins

B. fatty acids

C. glycogen

D. starch

Answer

The food prepared in the plant(autotroph) by the process of photosynthesis is glucose then it gets stored in plant leaves in the form of starch.

95. Question

Which of the following events does not occur in photosynthesis?

A. conversion of light energy into chemical energy

B. reduction of carbon dioxide to carbohydrates

C. oxidation of carbon to carbon dioxide

D. absorption of light energy by chlorophyll

Answer

The process of photosynthesis takes place in the following three steps:

• Absorption of light energy by chlorophyll

• Conversion of light energy to chemical energy and splitting of water molecules into hydrogen and oxygen.

• Reduction of carbon dioxide to carbohydrates.

96. Question

The opening and closing of the stomatal pores depends upon :

A. oxygen

B. water in guard cells

C. temperature

D. concentration of CO_2 in stomata

Answer

A. The guard cells regulate the opening and closing of stomatal pores. They swell, when water flows into the guard cells and stomatal pores get opens. Similarly, when the guard cells lose water, they shrink, become straight and the stomatal pores get closed.

97. Question

Most of the plants absorb nitrogen in one of the following forms. This is:

Options;

A. proteins

B. nitrates and nitrites

C. urea

D. atmospheric nitrogen

Answer

Plants take up nitrogen from the soil in the form of inorganic salts called nitrates (or nitrites), or in the form of organic compounds which are produced by bacteria from the atmospheric nitrogen.

98. Question

The first enzyme to mix with food in the digestive tract is :

A. pepsin

B. cellulose

C. amylase

D. trypsin

Answer

Saliva is a watery fluid which contains an enzyme called salivary amylase. Salivary amylase acts on starch and breaks down it into sugar.

99. Question

Which of the following is the correct statement ?

A. heterotrophs synthesise their own food

B. heterotrophs utilize solar energy for photosynthesis

C. heterotrophs do not synthesise their own food

D. heterotrophs are capable of converting carbon dioxide and water into carbohydrates

Answer

Those organisms which cannot make their own food from inorganic substances like carbon dioxide and water and depend on other organisms for their food are called heterotrophs. All the animals, fungi, and bacteria are examples of heterotrophs.

100. Question

In which of the following groups of organisms the food material is broken down outside the body and then absorbed?

A.Mushroom, Green plants, Amoeba B. Yeast, Mushroom, Bread mould

C.Paramecium, Amoeba, Cuscuta D. Cuscuta, Lice, Tapeworm

Answer

Saprophytes obtain their food from dead and decaying organisms by secreting hydrolytic enzymes over food. Examples: Yeast, mushroom, bread mould.

101. Question

Which of the following is the correct sequence of parts as they occur in the human alimentary canal ?

A. Mouth→ Stomach→ Small intestine→ Oesophagus→ Large intestine

B. Mouth→ Oesophagus→ Stomach → Large intestine→ Small intestine

C. Mouth→ Stomach→ Oesophagus→ Small intestine→ Large intestine

D. Mouth→ Oesophagus→ Stomach→ Small intestine→ Large intestine

Answer

The various organs of the human digestive system in sequence are: Mouth, Oesophagus, Stomach, Small intestine and Large intestine.

Questions Based on High Order Thinking Skills (HOTS)-Pg-28

102. Question

When a person eats sugary food, then organisms A present in his mouth act on sugar to produce a substance B. The substance B first dissolves the calcium salts from the top part C of the tooth and then from its middle part D forming holes E. These holes ultimately reach the part F in the lower part of tooth which contains nerves and blood vessels. The substance B irritates the nerve endings inside the tooth causing toothache.

(a) What are (i) organisms A, and (ii) substance B?

(b) What are (i) part C, and (ii) part D, of tooth known as?

(c) By what name are the holes E in the tooth known?

(d) Name the part F of the tooth.

(e) What will happen if organisms A reach part F of the tooth ?

Answer

(a) (i) Organisms A ---Bacteria

(ii) Bacteria (A), present in the mouth act on sugar and produce acid (B).

(b) (i) The topmost part of the tooth is enamel (C). It is the hardest tissue in the body.

(ii) The middle part of the tooth is known as dentine (D).

(c) Dental caries (E) is tooth decay.

(d) The lower part of the tooth is known as pulp cavity (F) which contains nerves and blood vessels.

(e) If bacteria (A) reach the pulp cavity (F) of the tooth it would cause inflammation and infection which would then lead to severe pain.

103. Question

H the teeth are not cleaned regularly, they become covered with a sticky yellowish layer W of food particles and bacteria. Since layer W covers the teeth, the alkaline liquid X secreted by glands Y inside the mouth cannot reach the teeth surface to neutralise the acid formed by the action of organisms Z on sugary food, and hence tooth decay sets in.

(a) What is W known as?

(b) What is (i) X, and (ii) Y?

(c) What are organisms Z?

(d) State one way of removing layer W from the teeth.

Answer

(a) W is Dental Plaque. (b) (i) X is Saliva (ii) Y is Salivary Glands. (c) Z are Bacteria. (d) Layer W can be removed by brushing teeth after eating.

104. Question

When a person puts food in his mouth, then teeth cut it into small pieces, chew and grind it. The glands A in the mouth secrete a substance B which is mixed with the food by tongue. The substance B contains an enzyme C which starts the digestion of food in the mouth. The slightly digested food from the mouth goes down a tube D. The special type of movements E in the walls of tube D push the food into stomach for further digestion. The stomach wall secretes gastric juice containing three substance F, G and H. One of the functions of F is to kill bacteria which may enter the stomach with food. The substance G protects the inside layer of stomach from the damaging effect of substance F whereas substance H is an enzyme for digestion. The partially digested food then enters into small intestine for further digestion.

(a) What is (i) gland A

(ii) substance B, and (iii) enzyme C?

(b) Name the tube D.

(c) What is the movement E known as?

(d) What are (i) F (ii) G, and (iii) H?

Answer

(a) (i) Salivary glands (A) present in the mouth and secrete saliva.

(ii) Salivary glands(A) secrete saliva (B) which contains an enzyme called salivary amylase (C).

(b) D is Oesophagus. Oesophagus is a long, thin and muscular tube that connects the throat (pharynx) to the stomach.

(c) Peristaltic movement (E) is a wave of contraction and expansion which occurs in the alimentary canal and helps to push the food forward.

(d) (i) Hydrochloric acid (ii) Mucus (iii) Enzyme pepsin

The stomach wall secretes gastric juice which contains three substances: Hydrochloric acid (F), the enzyme pepsin (G) and mucus (H).

105. Question

The partially digested food coming from the stomach of a person enters a long and narrow organ A in his body. The organ A receives the secretions of two glands : liver and pancreas. Liver secretes a greenish yellow liquid B which is normally stored in the organ C. Pancreas secretes pancreatic juice which contains three digestive enzymes D, E and F. The intestinal juice completes the process of digestion of food. The inner wall of organ A has millions of tiny finger-like projections G which help in the rapid absorption of digested food into blood stream. The undigested part of food then passes into wider tube H which absorbs most of the water from undigested food. The last part of tube H called I stores this undigested food (or waste) for some time. The undigested food is then passed out though opening J as faeces in the process known as K.

(a) Name the organ A

(b) Name (t) liquid B, and (it) organ C.

(c) What are the digestive enzymes D, E and F?

(d) Name the projections G present on the inner wall of organ A.

(e) Name (i) tube H (ii) part I (iii) opening J, and (iv) process K.

Answer

(a) Small intestine (A).

(b) Bile (B) is a alkaline fluid which is stored in the gall bladder (C).

(c) Pancreatic juice contains three digestive enzymes: Pancreatic amylase (D), Trypsin (E) and Lipase (F).

(d) The inner wall of small intestine (A) has millions of finger-like projections called Villi (G).

(e) (i) The undigested food passes from the small intestine (A) into a wide tube called Large intestine (H).

(ii) The last part of large intestine is Rectum (I).

(iii) The opening by which undigested food is passed out is Anus (J).

(iv) The process by which undigested food is thrown out from the body is Egestion (K).

106. Question

A unicellular animal P having no fixed shape ingests a food particle by forming temporary finger-like projections Q. The food particle is engulfed with a little surrounding water to form a temporary stomach R inside it. The chemicals S from surrounding cytoplasm enter into R and break down food into small and soluble molecules by chemical reactions. The digested food is absorbed directly into cytoplasm by the process T. The undigested food is thrown out of the body by the rupture of a cell organelle U in a process called V.

(a) Name the unicellular animal P. (b) What are (i) Q and (ii) R ?

(c) Name (i) chemicalS, and (ii) process T.

(d) Name (i) organelle U, and (ii) process V.

Answer

(a) Amoeba (P) is a unicellular animal which has no mouth for ingestion of food.

(b) (i) Amoeba (P) engulfs the food particles by forming finger-like projections called pseudopodia (Q).

(ii) The food is engulfed with little water to form a food vacuole (R).

(c) (i) Enzymes (S) breaks down food into small soluble molecules.

(ii) The digested food is absorbed directly into the cytoplasm by diffusion (T).

(d) (i) The undigested food is thrown out of the body by rupturing the cell membrane (U) (ii) Egestion (V) is the process of throwing the undigested food out of the body.

107. Question

There are four organisms A, B, C and D. The organism A eats only the flesh of other animals as food. The organism B can eat grains, fruits and vegetables as well as meat and fish. The organism C can make the food itself from simple inorganic substances present in the environment by utilising sunlight energy. On the other hand, organism D eats only plants and their products as food.

(a) Which organism is (i) omnivore

(ii) herbivore, and (iii) carnivore ?

(b) Which organism is an autotroph ?

(c) Which organism is/are heterotroph(s)?

(d) Which organism can be a producer ?

(e) Which organism is/are consumer (s)?

(f) Give one example each of organisms which could be like (i) A (ii) B (iii) C, and (iv) D

Answer

(a) (i) B is omnivore. (ii) D is herbivore (iii) A is carnivore.

(b) C is autotroph because it can make its food.

(c) A, B and D are heterotrophs because they cannot make their food.

(d) Organism C can be a producer because it can make own food.

(e) A, B and D are consumers because they cannot make their own food and depend on other organisms for their food.

(f) (i) Tiger (ii) Human beings (iii) Green Plants (iv) Goat

108. Question

The organisms A, B and C can obtain their food in three different ways. Organism A derives its food from the body of another living organism which is called its D, without killing it. The organism B takes in the solid food by the process of ingestion, digests a part of this food and throws out undigested food in the process called E. The organism C obtains its food from dead and decaying plants.

(a) What is the mode of nutrition of

(i) organism A

(ii) organism B, and

(iii) organism C ?

(b) What is the organism like D called ?

(c) Name the process E.

(d) Give one example each of organisms like (i) A (ii) B, and (ii) C.

(e) What is the general name of three modes of nutrition exhibited by organisms A, B and C ?

Answer

(a)

(i) The mode of nutrition of organism A is parasitic nutrition.

(ii) The mode of nutrition of organism B is holozoic nutrition.

(iii) The mode of nutrition of organism C is saprophytic nutrition

(b) The organism D is called host of organism A.

(c) The process by which undigested food is thrown out of the body is known as egestion (E).

(d) (i) Plasmodium (ii) Amoeba (iii) Fungi

(e) Heterotrophic nutrition

109. Question

An organism A which cannot move from one place to another, makes a simple food B from the substances C and D available in the environment. This food is made in the presence of a green coloured substance E present in organs F in the presence of light energy in a process called G. Some of the simple food B also gets converted into a complex food H for storage purposes. The food H gives a blue-black colour with dilute iodine solution.

(a) What is (i) organism A (ii) food B, and (iii) food H ?

(b) What are C and D?

(c) Name (i) green coloured substance E, and (ii) organ F.

(d) What is the process G?

Answer

(a)

(i) Green plant (A) cannot move from one place to another.

(ii) Green plant makes food glucose (B).

(iii) Glucose (B) gets converted into a complex food, starch (H).

(b) Plant can make own food from the simple substances carbon dioxide (C) and water (D).

(c) Green pigment called chlorophyll (E) present in the leaves of the plant.

(d) The process by which green plants make their own food is called photosynthesis (G).

110. Question

X is a wild animal which eats only the flesh of other animals whereas Y is a domestic animal which feeds mainly on green grass.

(a) What are animals like X known as?

(b) What are animals like Y known as ?

(c) Which animal, X or Y, has a longer small intestine? Why?

(d) Name one animal which is like X.

(e) Name one animal which is like Y.

Answer

(a) Carnivores

(b) Herbivores

(c) Animal (Y) has a longer small intestine. Y is an herbivorous animal which eats grass. Grass contains cellulose which is a carbohydrate and gets digested with difficulty. A longer small intestine facilitates complete digestion of cellulose.

(d) Lion

(e) Cow

Very Short Answer Type Questions-Pg-46

1. Question

Do all cells use oxygen to produce energy?

Answer

No, all cells do not use oxygen to produce energy.

2. Question

Name one substance which is produced in anaerobic respiration by an organism but not in aerobic respiration.

Answer

Ethanol is the substance that is produced in anaerobic respiration by an organism but not in aerobic respiration.

3. Question

Name one organism which can live without oxygen.

Answer

Yeast is an organism which doesn't utilize oxygen.

4. Question

In which type of respiration, aerobic or anaerobic, more energy is released?

Answer

Aerobic respiration produces more energy than anaerobic respiration.

5. Question

Name the substance whose build up in the muscles during vigorous physical exercise may cause cramps.

Answer

Lactic acid slowly poison our muscles and cause muscular cramps.

6. Question

Which part of roots is involved in the exchange of respiratory gases?

Answer

Root hairs takeup oxygen from the soil and thus get involved in the exchange of respiratory gases.

7. Question

Name the process by which plant parts like roots, stems, and leaves get oxygen required for respiration.

Answer

The process by which plant parts like roots, stems, and leaves get oxygen required for respiration is called as diffusion.

8. Question

Name the pores in a leaf through which respiratory exchange of gases takes place.

Answer

Stomata present on the surface of the leaves exchange gases for respiration.

9. Question

Name the areas in a woody stem through which respiratory exchange of gases takes place.

Answer

Lenticels present on the stem of a plant exchange gases for respiration.

10. Question

What is the name of the extensions of the epidermal cells of a root which help in respiration?

Answer

The extensions of the epidermal cells of a root which help in respiration is known as Root Hair.

11. Question

Out of photosynthesis and respiration in plants, which process occurs :

(a) all the time ?

(b) only at daytime ?

Answer

(a) Respiration is the process through which plants breathe and it happens all the time.

(b) Photosynthesis happens only during the day time as it requires sunlight.

12. Question

Name the organs of breathing in fish.

Answer

The organs with which fish breathe is known as Gills.

13. Question

Name an animal which absorbs oxygen through its moist skin.

Answer

Earthworm is the animal which exchanges gases i.e. oxygen through its moist skin.

14. Question

Name an animal which depends on simple diffusion of gases for breathing.

Answer

The animal which depends on simple diffusion of gases for breathing is the single-celled Amoeba.

15. Question

Name two animals which breathe through gills.

Answer

Two animals which breathe through gills are Prawns and Mussels.

16. Question

The trachea divides into two tubes at its lower end. What is the name of these tubes?

Answer

The two tubes at the lower end of trachea are known as Bronchi.

17. Question

Where does the blood absorb oxygen in the human body?

Answer

Alveoli of lungs is the place where gaseous exchange take place and blood absorb oxygen in the body.

18. Question

Name the red pigment which carries oxygen in blood.

Answer

Haemoglobin is a dark red respiratory pigment that carries oxygen in blood.

19. Question

Which gases are exchanged in your lungs?

Answer

Oxygen and Carbon Dioxide are the gases which are exchanged inside the lungs.

20. Question

Where in the lungs does gas exchange take place?

Answer

Alveoli of lungs is the place where exchange of gases takes place.

21. Question

What is the name of tiny air-sacs at the end of smallest bronchioles in the lungs ?

Answer

The tiny air-sacs at the end of the smallest bronchioles are known as Alveoli.

22. Question

What is the other name of wind-pipe?

Answer

Wind-pipe is also known as Trachea.

23. Question

What organs are attached to the two bronchi?

Answer

On each of the bronchi, lungs are attached.

24. Question

In the lungs:

(a) what substance is taken into the body ?

(b) what substance is removed from the body ?

Answer

(a) Inside the lungs, oxygen is taken into the blood.

(b) In the lungs, Carbon Dioxide is taken out from the body.

25. Question

State whether the following statements are true or false :

(a) During respiration, the plants take $C0_2$ and release O_2.

(b) Energy can be produced in cells without oxygen.

(c) Fish and earthworm exchange gases during respiration in the same way.

Answer

(a) False. (b) True. (c) False.

26. Question

Fill in the following blanks with suitable words:

(a) The organs of respiration in man are the.....

(b) The actual exchange of gases takes place in the.....of the lungs.

(c) .....in the lungs provide a very large surface area for gaseous exchange.

(d) Yeast undergoes.....respiration whereas Amoeba undergoes.....respiration.

(e) Gills are the breathing organs in.....

Answer

(a) Lungs.

(b) Alveoli.

(c) Alveoli.

(d) Anaerobic, aerobic.

(e) Fish.

Short Answer Type Questions-Pg-47

27. Question

Explain why, a land plant may die if its roots remain waterlogged for a long time.

Answer

Land plants die if their roots remain waterlogged for a long time because excess of water, in the soils, expels all the air that is present in between the soil particles. Because of the absence of air, oxygen is not available to the roots and they respire anaerobically leading to generation of alcohol which kills the plants.

28. Question

What are the differences between aerobic and anaerobic respiration? Name some organisms that use anaerobic mode of respiration.

Answer

Aerobic Respiration	Anaerobic Respiration
Takes Place when oxygen is present.	Takes place when oxygen is not present.
Food gets broken down completely.	Food get broken down partially.
End products include carbon dioxide and water.	End products include ethanol and carbon dioxide (in yeast) and lactic acid (in animal muscles).
Produces lot of energy.	Produces less energy.

Some organisms that use anaerobic mode of respiration are Yeast and some bacteria.

29. Question

Name the final product/products obtained in the anaerobic respiration, if it takes place:

(a) in a plant (like yeast).

(b) in an animal tissue (like muscles).

Answer

(a) Anaerobic respiration in plants like yeast produces ethanol and carbon dioxide.

(b) Anaerobic respiration in animal tissues like muscles produces lactic acid.

30. Question

What type of respiration takes place in human muscles during vigorous physical exercise? Give reason for your answer.

Answer

During vigorous physical exercise, anaerobic respiration takes place in human muscles because oxygen is used faster in the muscles compared to its supply by the blood.

31. Question

Name the type of respiration in which the end products are:

(a) C_2H_50H and $C0_2$

(b) $C0_2$ and H_20

(c) Lactic acid

Give one example of each case where such a respiration can occur.

Answer

(a) Anaerobic respiration in yeast produces C_2H_50H (ethanol) and $C0_2$(carbon dioxide)

(b) Aerobic respirations in human beings produces $C0_2$(carbon dioxide) and H_20 (water).

(c) Anaerobic respiration in animal muscles produces lactic acid.

32. Question

Define breathing. State the differences between breathing and respiration.

Answer

Breathing is the process by which organisms takes oxygen from the air and releases carbon dioxide.

Breathing	Respiration
It is a simple process.	It is a complex process.
It involves taking oxygen from the air and releasing carbon dioxide in the air.	It involves breathing and oxidation of food to release energy.
It is a physical process.	It is a bio-chemical process.

33. Question

What are the different ways in which glucose is oxidised to provide energy in various organisms? Give one example of each.

Answer

Glucose is oxidized, to provide energy in various organisms, in two ways –

i. Aerobic respiration – this respiration process takes place using oxygen. For example, plants and animals oxidize glucose and break it down into carbon dioxide and water to release energy.

ii. Anaerobic respiration – This respiration process takes place in the absence of oxygen. For example, yeast and some bacteria oxidize glucose into ethanol and carbon dioxide.

34. Question

Explain why, when air is taken in and let out during breathing, the lungs always contain a residual volume of air.

Answer

During the breathing process when air is taken in and let out, some of the air remains inside the lungs to provide sufficient time for oxygen absorption into the blood and release of carbon dioxide from the blood.

35. Question

Explain why, it is dangerous to inhale air containing carbon monoxide.

Answer

Carbon monoxide binds itself strongly with haemoglobin in the blood and prevents it from carrying oxygen to the different parts of the body including brain. Due to this, the person cannot breathe and may even die. Hence, it is dangerous to inhale air containing carbon monoxide.

36. Question

Describe the process of respiration in Amoeba. State whether it is anaerobic respiration or aerobic respiration.

Answer

Respiration happens in amoeba through simple diffusion of gases. It lives in water which contains dissolved oxygen. The diffusion of gases takes place through its cell membrane. Through its thin cell membrane this oxygen diffuses into the body of amoeba and spreads into the whole body. This oxygen is used for respiration inside the Amoeba cell. The process of respiration produces carbon dioxide which diffuses out again through its thin cell membrane.

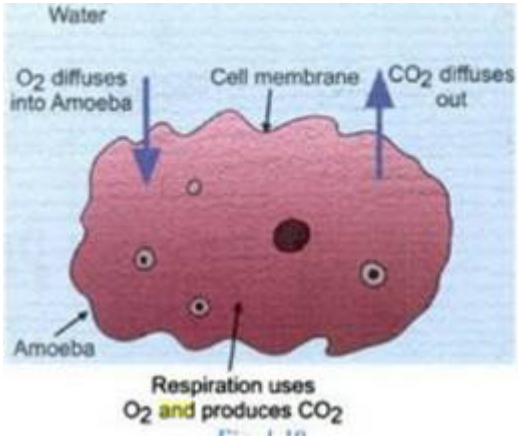


Figure to show the process of breathing (gaseous exchange) in Amoeba

It is an aerobic respiration.

37. Question

State the three common features of 'all the respiratory organs like skin, gills and lungs.

Answer

The three common features of all respiratory organs like skin, gills and lungs are as follows:

i) They have a large surface area to absorb sufficient amount of oxygen.

ii) They have thin walls which makes diffusion and exchange of gases easier.

iii) All respiratory organs like skin, gills and lungs have a rich blood supply for the transportation of respiratory gases.

38. Question

Describe the process of respiration in fish.

Answer

The respiratory organ in a fish is called as gills which is covered by gill covers. The fish has gills on both sides of its head. Fish live in water containing dissolved oxygen. During the process of respiration, fish takes in the water through its mouth and passes it over the gills. The gills extract the oxygen, dissolved in the water, and send it to all the parts of the fish through blood. The carbon dioxide produced during respiration is carried by the blood to the gills where it is expelled into the surrounding water.

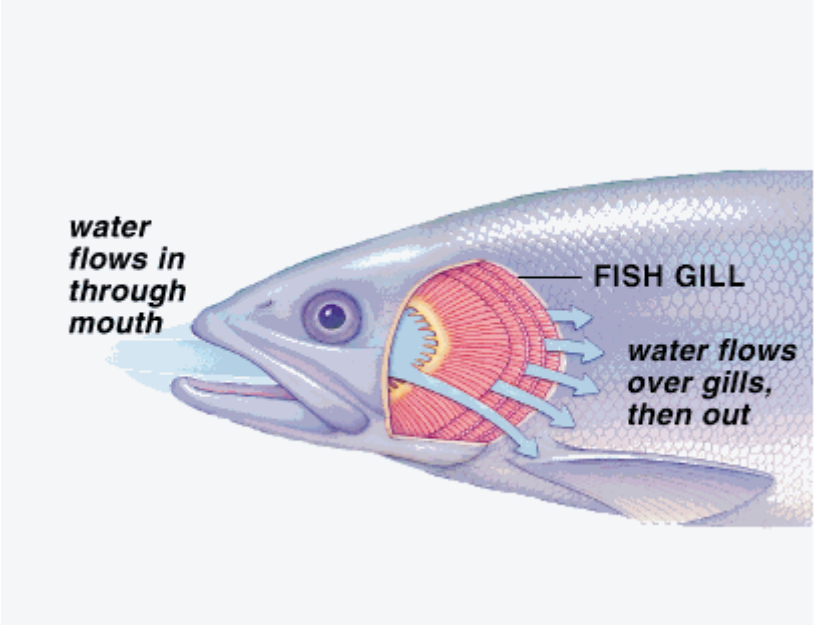


Figure to show the process of breathing in fish

39. Question

What would be the consequences of deficiency of haemoglobin in our bodies?

Answer

The haemoglobin present in the blood is responsible for carrying oxygen in the blood. Thus the deficiency of haemoglobin will reduce the oxygen carrying capacity of the blood resulting in tiredness, breathing problems and lack of energy.

40. Question

Describe the process of respiration in the following parts of a plant:

(a) Root (b) Stem (c) Leaves

Answer

(a) The epidermal cells of a root have extensions which are known as root hairs. These root hairs are in contact with the soil and the air present in between the soil particles diffuses through these root hairs to reach all other cells of the root for respiration. Carbon dioxide produced by the cells during the respiration reaches the root hairs and moves out through the process of diffusion. Hence, respiration in roots happens by diffusion of respiratory gases through root hairs.

(b) The stems of herbaceous plants have stomata through which oxygen diffuses into the stem and reaches all the cells for respiration. The carbon dioxide produced during respiration diffuses out the stomata. In woody stems, respiration happens through lenticels present in the bark.

(c) Leaves of a plant have tiny pores called stomata. Oxygen, present in the air, diffuses through these stomata and reaches other cells for respiration. Carbon dioxide produced in the cells during respiration also diffuses out through these stomata.

41 A. Question

What is meant by aquatic animals and terrestrial animals ?

Answer

The animals which live in water are aquatic animals and animals which live on land are terrestrial animals.

41 B. Question

From where do the aquatic animals and terrestrial animals obtain oxygen for breathing and respiration ?

Answer

Aquatic animals utilize the oxygen present in the water for respiration while terrestrial animals take oxygen from the air.

42. Question

Why do fishes die when taken out of water?

Answer

Fishes do not have lungs which can take oxygen from air. Hence, they die when taken out of water. They have gills which can only take oxygen dissolved in water.

43. Question

Why is the rate of breathing in aquatic organisms much faster than in terrestrial organisms?

Answer

The oxygen content of water is much less than the oxygen content of air and hence rate of breathing is aquatic organisms is faster than in terrestrial organisms.

44. Question

Name the energy currency in the living organisms. When and where is it produced?

Answer

The energy currency in the living organisms is called as "ATP". During anaerobic respiration in lower organisms, it is produced in cytoplasm while in higher organisms, which respire aerobically, it is produced in mitochondria.

45. Question

Explain why, plants have low energy needs as compared to animals.

Answer

Plants have low energy needs as compared to animals because they do not move. Moreover, in a large plants there are many dead cells like sclerenchyma because of which they also need less energy.

46. Question

Explain how, it would benefit deep sea divers if humans also had gills.

Answer

If humans also had gills, deep sea divers could remain under the sea for a longer time without using oxygen cylinders as gills would extract the oxygen, dissolved in water, for breathing.

Long Answer Type Questions-Pg-48

47 A. Question

What is the function of the respiratory system?

Answer

The primary function of respiratory system is to inhale oxygen, which is then used to digest food and produce energy, and exhale carbon dioxide.

47 B. Question

What are the major organs of respiratory system in man (or humans)?

Answer

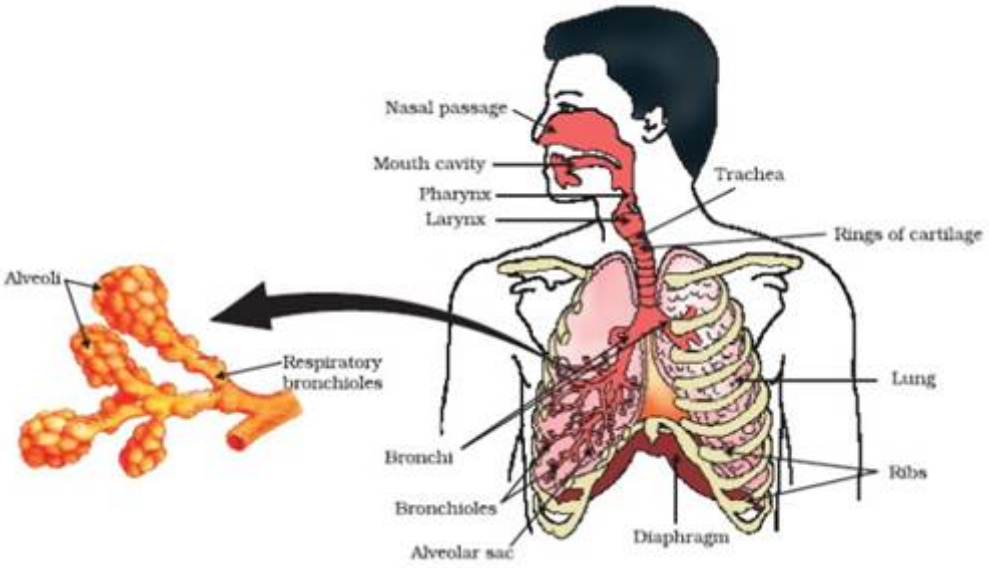
The major organs of respiratory system in humans are: Nose, Nasal Passage, Trachea (wind pipe), Bronchi, Lungs and diaphragm.

47 C. Question

Draw a labelled diagram of the human respiratory system.

Answer

Human Respiratory System:



48 A. Question

Explain how, the air we breathe in gets cleaned while passing through the nasal passage.

Answer

The inner lining of nostril is lined by nasal hair and remains wet due to mucus secretion. When air passes through the nasal passage, the nasal hair and mucus trap the dust particles and other impurities present in the inhaled air. Thus, clean air goes into the lungs.

48 B. Question

Why do the walls of trachea not collapse when there is less air in it?

Answer

The walls of trachea do not collapse when there is no air in it because they are supported by rings of cartilage.

48 C. Question

How are oxygen and carbon dioxide exchanged in our body during respiration?

Answer

When we breath in, the air sacs or alveoli get filled with air containing oxygen. The alveoli are surrounded by thin blood vessels called capillaries carrying blood in them. So, the oxygen of air diffuses out from the alveoli into the blood. Blood carries this oxygen to all the parts of the body. When it passes through the tissues, the oxygen in the blood diffuses into the cells and mixes with the digested food to release energy. Carbon dioxide produced during respiration in the cells diffuses into the blood which is carried to the lungs. Inside the lungs, the carbon dioxide diffuses into the alveoli.

48 D. Question

How are lungs designed in human beings to maximise the exchange of gases?

Answer

To maximize the exchange of gases, lungs have millions of alveoli which provides a larger surface area for the exchange of gases.

49 A. Question

Give the main points of difference between respiration in plants and respiration in animals.

Answer

Respiration in Plants	Respiration in Animals
It doesn't have specialized organ for respiration. All the parts of the plants perform respiration individually.	In animals, respiration occurs through specialized organs like lungs, gills, etc.
There is a little transport of respiratory gases from one part of the plant to the other during respiration.	Respiratory gases are usually transported over long distances inside an animal during respiration.
The rate of respiration is slow.	The rate of respiration is fast.

49 B. Question

Describe the exchange of gases which takes place in the leaves of a plant (a) during daytime, and (b) at night.

Answer

(i) During the daytime, plants carry out both photosynthesis and respiration. During photosynthesis, oxygen is produced some of which is used by the plant leaves and rest is released into the air. During respiration, carbon dioxide is produced which is entirely utilized by leaves for photosynthesis. Leaves even absorb more carbon dioxide from the air for photosynthesis. Thus during the day time, the exchange of gases looks like : Oxygen diffuses out and carbon dioxide diffuses in.

(ii) During the night, photosynthesis doesn't take place and hence only respiration process occurs in plants. Because of the absence of photosynthesis, oxygen is not produced. For respiration, leaves take in oxygen from the air and release carbon dioxide into the air. Thus during the night time, the exchange of gases looks like : Oxygen diffuses in and carbon dioxide diffuses out.

49 C. Question

Which contains more carbon dixoide: exhaled air or inhaled air? Why?

Answer

In the exhaled air, carbon dioxide content is always more than inhaled air because during the respiration process, oxygen breaks down the glucose and generates carbon dioxide which passes out of the body in the exhaled air.

50 A. Question

"Respiration is a vital function of the body". Justify this statement.

Answer

Respiration is a vital function of the body as it provides energy for carrying out biological functions which are essential for survival and maintenance of an organism.

50 B. Question

What is the main difference between aerobic respiration and anaerobic respiration? Give one example of each.

Answer

Aerobic Respiration	Anaerobic Respiration
Takes Place when oxygen is present.	Takes place when oxygen is not present.
Food gets broken down completely.	Food get broken down partially.
End products include carbon dioxide and water.	End products include ethanol and carbon dioxide (in yeast) and lactic acid (in animal muscles).
Produces lot of energy.	Produces less energy.
Example: Human beings	Example: Yeast

50 C. Question

What type of respiration takes place (i) in yeast, and (ii) in humans ?

Answer

In yeast- Anaerobic respiration

In humans-Aerobic respiration

51 A. Question

Why is diffusion insufficient to meet the oxygen requirements of large multicellular organisms like humans?

Answer

Large multicellular organisms like humans cannot depend on diffusion to meet the oxygen requirements as the volume is too big and oxygen cannot diffuse into all the cells quickly. Moreover, in order to reach each and every cell of the human body, oxygen will have to travel a large distance.

51 B. Question

What type of arrangement exists in the bodies of large animals to meet their oxygen requirements adequately?

Answer

Large organisms have oxygen carrying pigments, called haemoglobin, in the blood, which carries the oxygen from the lungs to different parts of the body.

51 C. Question

What advantage a terrestrial animal has over an aquatic animal with regard to obtaining oxygen for respiration?

Answer

The advantage that terrestrial animals have over an aquatic animal is that terrestrial animals live in an oxygen rich environment from where they can take as much oxygen as they want.

Multiple Choice Questions (MCQs)-Pg-48

52. Question

Which of the following is not produced during anaerobic respiration in unicellular fungus?

A. C_2H_50H

B. H_2O

C. $C0_2$

D. ATP

Answer

During anaerobic respiration, the unicellular fungus (yeast) breaks down the glucose into ethanol (C_2H_50H) and carbon dioxide ($C0_2$), and release energy in the form of ATP.

53. Question

One of the following organisms can live without oxygen of air. This organism is:

A. Amoeba

B. Yak

C. Yeast

D. Leech

Answer

The respiration which takes place without oxygen is called anaerobic respiration. Some micro-organisms like yeast and bacteria obtain energy by anaerobic respiration.

54. Question

During respiration, the exchange of gases takes place in :

A. bronchi

B. alveoli

C. bronchioles

D. trachea

Answer

The tiny air-sacs at the end of the smallest bronchioles are known as Alveoli. Alveoli is the place where gaseous exchange take place.

55. Question

In one of the following organisms, the gaseous exchange during respiration does not take place through cell membrane/skin. This organism is:

A. Electric eel

B. Leech

C. Earthworm

D. Amoeba

Answer

Aquatic animals like electric eel have gills as respiratory organs which extract oxygen dissolved in the water and carbon dioxide from the body.

56. Question

Which of the following is correct for the process of anaerobic respiration?

Carbon dioxide A lot of energy always produced released

A. No Yes

B. No No

C. Yes No

D. Yes Yes

Answer

The end product of anaerobic respiration may be ethanol and carbon dioxide (in yeast) or lactic acid (in animal muscles). Anaerobic respiration produces much less energy which gets stored in the ATP molecules.

57. Question

Which of the following increases in muscle cells when they are lacking in oxygen?

A. carbon dioxide

B. lactose

C. lactic acid

D. uric acid

Answer

Due to the lack of oxygen, muscles do anaerobic respiration and produce lactic acid.

58. Question

Internal respiration may be defined as:

A. breathing in and releasing of oxygen in the tissue

B. the oxidation of food substances to release energy

C. the building up (synthesis) of complex substances

D. getting rid of carbon dioxide that would accumulate in the tissues.

Answer

Internal respiration is the exchange of gases between body cells and blood to oxidize food substances to release energy.

59. Question

When air is blown from mouth into a test-tube containing lime water, the lime water turns milky due to the presence of :

A. oxygen

B. carbon dioxide

C. nitrogen

D. water vapour

Answer

When air is blown from mouth into a test-tube containing lime water, the lime water turns milky due to the presence of carbon dioxide.

60. Question

Which of the following is the correct sequence of air passage during inhalation?

A. nostrils → larynx → pharynx → trachea → lungs

B. nasal passage → trachea → pharynx → larynx → alveoli

C. larynx → nostrils → pharynx → lungs

D. nostrils → pharynx → larynx → trachea → alveoli

Answer

The correct sequence of air passage during inhalation is :

nostrils → pharynx → larynx → trachea → alveoli

61. Question

Lack of oxygen in muscles often leads to cramps in the legs of sprinters. This is due to conversion of pyruvate to:

A. ethanol

B. carbon dioxide

C. acetic acid

D. lactic acid

Answer

Due to the lack of oxygen, anaerobic respiration takes place in the human muscles

62. Question

During the deficiency of oxygen in tissues of human beings, pyruvic acid is converted into lactic acid in :

A. cytoplasm

B. chloroplast

C. mitochondria

D. golgi body

Answer

In the absence of oxygen, pyruvic acid is converted into lactic acid in the cytoplasm of the cell.

63. Question

Which of the following statements are correct ?

(i) pyruvate can be converted into ethanol and carbon dioxide by yeast

(ii) fermentation takes place in the case of aerobic bacteria

(iii) fermentation takes place in mitochondria

(iv) fermentation is a form of anaerobic respiration

A. (i) and (iii)

B. (ii) and (iv)

C. (i) and (iv)

D. (ii) and (iii)

Answer

Fermentation is a form of anaerobic respiration. Pyruvate can be converted into ethanol and carbon dioxide by yeast during fermentation.

64. Question

Which of the following statements are true about respiration?

(i) during inhalation, ribs move inward and diaphragm is raised.

(ii) the. gaseous exchange takes place in the alveoli.

(iii) haemoglobin has greater affinity for carbon dioxide than oxygen.

(iv) alveoli increase surface area for the exchange of gases

A. (i) and (iv)

B. (ii) and (iii)

C. (i) and (iii)

D. (ii) and (iv)

Answer

The tiny air-sacs at the end of the smallest bronchioles are known as Alveoli. Alveoli provides a large surface area for the exchange of gases.

65. Question

Which of the following is known as the energy currency of cells in biology ?

A. DTP

B. PDP

C. ATP

D. DDT

Answer

The energy currency in the living organisms is called as “ATP”. During anaerobic respiration, it is produced in cytoplasm while in higher organisms, which respire aerobically, it is produced in mitochondria.

66. Question

The two organisms which breathe only through their moist skin are :

A. fish and frog

B. frog and earthworm

C. leech and earthworm

D. fish and earthworm

Answer

The animals like earthworm which live in soil use their skin to absorb oxygen from the air and remove carbon dioxide in the atmosphere.

67. Question

One of the following animals does not use tracheae as the respiratory organs. This animal is:

A. grasshopper

B. prawn

C. mosquito

D. cockroach

Answer

In insects like grasshopper, mosquito and cockroach has the tiny holes called spiracles on the sides of their body and the air tube called tracheae as respiratory organs.

68. Question

The photosynthesis in a plant is not taking place during the day time if the plant is releasing:

A. water vapour

B. oxygen

C. carbon dioxide

D. all the above

Answer

Photosynthesis is the process by which green plants make their own food by using simple substances like CO_2 and water in the presence of sunlight. During the day time, if plant is releasing CO_2, it means photosynthesis is not taking place in a plant and only respiration is happening.

69. Question

The breathing and respiration in woody stem of a plant takes place through :

A. root hair

B. lenticels

C. closed stomata

D. open stomata

Answer

In woody stem, breathing and respiration takes place through lenticels.

70. Question

One of the following organism does not depend on simple diffusion of gases for breathing and respiration. This organism is :

A. Amoeba

B. Prawn

C. Planaria

D. Bryophyllum

Answer

Prawn is a multicellular organism. So it is not dependent on simple diffusion of gases for breathing and respiration.

71. Question

During marathon, we sometimes get painful contractions of leg muscles due to the accumulation of one of the following in leg muscles. This is :

A. carbon dioxide

B. alcohol

C. lactose

D. lactic acid

Answer

During vigorous physical exercise, anaerobic respiration takes place in human muscles because oxygen is used faster in the muscles compared to its supply by the blood. Thus, sudden buildup of lactic acid poison our muscles and cause muscular cramps.

72. Question

In cockroaches, air enters the body through:

A. lungs

B. gills

C. spiracles

D. skin

Answer

A cockroach has small openings on the sides of the body called spiracles. Air enters the body though these external openings.

73. Question

Which of the following is most likely to have a much higher breathing rate?

A. man

B. fish

C. dog

D. sparrow

Answer

The oxygen content of water is much less than the oxygen content of air and hence rate of breathing is aquatic organisms like fish is faster than in terrestrial organisms like dog, man and sparrow.

Questions Based on High Order Thinking Skills (HOTS)-Pg-50

74. Question

During the respiration of an organism A, 1 molecule of glucose produces 2 ATP molecules whereas in the respiration of another organism B, 1 molecule of glucose produces 38 ATP molecules.

(a) Which organism is undergoing aerobic respiration?

(b) Which organism is undergoing anaerobic respiration?

(c) Which type of organism, A or B, can convert glucose into alcohol?

(d) Name one organism which behaves like A

(e) Name two organisms which behave like B

Answer

(a) Organism B

(b) Organism A

(c) Organism A can convert glucose into alcohol by anaerobic respiration.

(d) Yeast behaves like organism A

(e) Man, fish behave like organism B

75. Question

A, Band Care three living organisms. The organism A is a unicellullar fungus which can live without air. It is used in the commercial production of an organic compound P from molasses. The organism B is a unicellular animal which lives in water and feeds and moves by using pseudopodia. It breathes through an organelle Q. The organism C is a tiny animal which acts as a carrier of malarial parasite. It breathes and respires through a kind of tiny holes Rand air-tubes Sin its body.

(a) What are organisms (i) A (ii) B, and (iii) C?

(b) Name (i) P (ii) Q (iii) R, and (iv) S.

(c) Which organism/ organisms undergo aerobic respiration?

(d) Which organism/ organisms undergo anaerobic respiration?

Answer

(a) Organisms (i) Yeast (ii) Amoeba (iii) Mosquito

(b) (i) Ethanol (C_2H_5OH) (ii) Cell membrane (iii) Spiracles and (iv) Tracheae

(c) Organism B (Amoeba) and organism C (mosquito) undergo aerobic respiration.

(d) Organism A (yeast) undergoes anaerobic respiration and produce ethanol and carbon dioxide.

76. Question

There are five animals P, Q R, S and T. The animal P always lives in water and has gills for breathing. The animal Q can stay in water as well as on land and can breathe both, through moist skin and lungs. The animal R lives in soil and breathes only through its skin. The animal S lives on land and breathes through spiracles and tracheae. And animal T lives in water and breathes through its cell membrane.

(a) Which of the animals could be Amoeba?

(b) Which of the animals could be frog?

(c) Which animal could be fish?

(d) Which animal could be grasshopper?

(e) Which animal could be earthworm?

Answer

(a) Animal T could be Amoeba because it lives in water and breathes through its cell membrane.

(b) Animal Q could be frog because it can stay in water as well as on land and can breathe both, through moist skin and lungs.

(c) Animal P could be fish because it lives in water and has gills for breathing.

(d) Animal S could be grasshopper because lives on land and breathes through spiracles and tracheae.

(e) Animal R could be earthworm because it lives in soil and breathes only through its skin.

77. Question

Some sugar solution is taken in a test-tube and a little of substance X in powder form is added to it. The mouth of test-tube is closed with a cork and allowed to stand for some time. On opening the cork, a characteristic smell of substance Y is obtained and a gas Z is also observed to be formed. The gas Z extinguishes a burning matchstick.

(a) What could be (i) X, (ii) Y, and (iii) Z ?

(b) What is the process of converting sugar into substance Y by the action of X known as? (c) What type of respiration is exhibited by X in the above process ?

Answer

(a) (i) Yeast (ii) Ethanol (iii) Carbon dioxide

(b) Fermentation is the process by which sugar converts into ethanol by the action of Yeast.

(c) Fermentation is an example of anaerobic respiration which is done by yeast (X) in the above experiment.

78. Question

Consider the following chemical reactions which take place in different organisms/tissues under various conditions:

(i) Glucose $\xrightarrow{\text{Respiration}}$ Ethanol + Carbon dioxide + Energy

(ii) Glucose $\xrightarrow{\text{Respiration}}$ Carbon dioxide + Water + Energy

(iii) Glucose $\xrightarrow{\text{Respiration}}$ Lactic acid + Energy

(a) Name one organism which respires according to equation (i) above.

(b) Name one organism which respires according to equation (ii) above.

(c) When and where does respiration represented by equation (iii) above take place?

(d) Which equation/equations represent aerobic respiration ?

(e) Which equation/equations represent anaerobic respiration ?

(f) Which of the above reactions produces the maximum amount of energy ?

Answer

(a) Yeast.

(b) Human beings

(c) Such kind of respiration occurs in animal's muscles, when the animal needs more energy for doing heavy physical exercises.

(d) Chemical reaction (ii) represents the aerobic respiration.

(e) Chemical reactions (i) and (iii) represent the anaerobic respiration.

(f) Chemical reaction (ii) represents the aerobic respiration. In aerobic respiration, maximum amount of energy is produced.

79. Question

When a person breathes in air, the air enters into his body through an organ A having two holes B in it. The air then passes through pharynx and larynx and enters into a tube C. The tube C divides into two smaller tubes D at its lower end. The two smaller tubes are attached to two respiratory organs E. Each smaller tube divides inside the organs E to form a large number of still smaller tubes called F. The smallest tubes F have air-sacs G at their ends in

which gaseous exchange takes place in the body of the person. What are A, B, C, D, E, F and G?

Answer

A = Nose; B =Nostrils; C =Trachea (Windpipe); D =Bronchi; E =Lungs; F =Bronchioles; G =Alveoli

80. Question

An organism X having breathing organs A lives on land. When organism X goes under water, it cannot survive for a long time unless carrying an oxygen cylinder. On the other hand, the organism Y having breathing organs B always lives in water and if taken out of water; it dies after a short while. A third organism Z having. breathing organs C and D which lives on the banks of ponds, lakes and rivers can survive on land as well as in water equally well.

(a) What could organism X be ? Name the breathing organs A.

(b) What could organism Y be ? Name the breathing organs B.

(c) What could organism Z be? Name the breathing organs C and D.

(d) Out of X, Y and Z, which organism is (i) amphibian, (ii) aquatic, and (iii) terrestrial ?

Answer

(a) Organism X could be man. Man (X) have the lungs (A) as breathing organ.

(b) Organism Y could be Fish. Fish has the gills (B) as breathing organ.

(c) Organism Z could be frog. Frog has lungs (C) and skin (D) as breathing organs.

(d) (i) Organism Z (ii) Organism Y (iii) Organism X

Very Short Answer Type Questions-Pg-72

1. Question

What is the name of tissues which transport:

(a) food in a plant?

(b) water and minerals in a plant?

Answer

(a) Phloem is a plant tissue which transport food from the leaves to other parts of the plant.

(b) Xylem is a plant tissue which transport water and minerals from the soil to the various parts of the plant body.

2. Question

What substance/substances are transported in plants by:

(a) xylem vessels and tracheids?

(b) sieve tubes (or phloem)?

Answer

(a) Xylem vessels and tracheids are two elements of xylem tissue which help in the transportation of water.

(b) The cells of phloem are called sieve tubes. Sieve tubes are conducting element of phloem which is responsible for transportation of food.

3. Question

Which organ acts as a pump in the circulatory system?

Answer

Heart is a muscular organ which act as a pumping organ in the circulatory system.

4. Question

Veins and arteries carry blood. Which of these carry blood :

(a) away from the heart?

(b) back to the heart?

Answer

(a) Arteries carry blood from the heart to different organs.

(b) Veins carry blood from different organs to the heart.

5. Question

Where does blood absorb oxygen?

Answer

The exchange of various materials like carbon dioxide, oxygen, etc., between the blood and the body cells takes place through capillaries.

6. Question

What stops blood from flowing backwards through the heart?

Answer

The valves present in the heart prevent the blood flowing backward through the heart.

7. Question

Name (i) largest artery, and (ii) largest vein, in our body.

Answer

(i) The aorta is the largest blood (artery) vessel in the body.

(iii) The vena cava is the largest vein in the body.

8. Question

What gaseous waste products are excreted by plants?

Answer

The main waste products of plants are carbon dioxide, oxygen and water vapour.

9. Question

Where is the dirty blood in our body filtered?

Answer

The dirty blood in our body is filtered in glomerulus present in the kidney.

10. Question

Name the procedure used in the working of artificial kidney.

Answer

Dialysis is the artificial process which is used in artificial kidney to get rid of waste and unwanted water from the blood.

11. Question

From the following terms, choose one term which includes the other four: Plasma, Platelets, Blood, RBC, WBC

Answer

Blood is a fluid connective tissue which is composed of plasma, platelets, RBC and WBC.

12. Question

What are the components of the transport system in highly organized plants?

Answer

There are two components of the transport system in plants namely xylem and phloem

13. Question

Out of xylem and phloem, which one carries materials:

(a) upwards as well as downwards?

(b) only upwards?

Answer

(a) Phloem carries food from leaves in both the directions, upwards as well as downwards, depending on the requirement of the plant.

(b) Xylem carries water and dissolved minerals only in upward direction from roots to the leaves of plant.

14. Question

Name two liquids which help in the transport of substances in the human body.

Answer

Blood and lymph are two liquid of human circulatory system which help in the transportation of substances in the human body.

15. Question

What is the other name of main vein?

Answer

The main vain carries deoxygenated blood from all the parts of the body to heart. It is also known as Vena cava.

16. Question

Name the conducting tissue of plants which is made of sieve tubes along with companion cells.

Answer

Phloem is a conducting tissue of plant which is made of two elements i.e. sieve tube and companion cells.

17. Question

Name the conducting tissue in plants which is made of

(a) living cells, and

(b) dead cells.

Answer

(a) Phloem is a conducting tissue of a plant which is made up of sieve tubes. Sieve tubes are living cells which contain cytoplasm.

(b) Xylem is made up of xylem vessels and tracheids which are non-living cells.

18. Question

State the term used for the transport of food from leaves to other parts of plant.

Answer

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

19. Question

Which process in a plant is accomplished by utilising energy from ATP : transport of water and minerals or transport of food ?

Answer

The transport of food in a plant is accomplished by utilizing energy from ATP.

20. Question

Name the two types of transport systems in the human beings.

Answer

There are two types of transport systems in the human beings:

(i) Blood circulatory system

(ii) Lymphatic system

21. Question

Name a waste gas released by the plants (a) only during the day time, and

(b) only during the night time.

Answer

(a) Plants excrete oxygen as waste product by the process of photosynthesis only during the day time.

(b) Plant release carbon dioxide as waste product by the process of respiration during the night time.

22. Question

Name one animal having single circulation of blood and another having double circulation.

Answer

The single circulation of blood is found in only fishes whereas the double circulation of blood is found in human beings.

23. Question

State whether the following statements are true or false :

(a) Some organisms store wastes in body parts.

(b) The value of systolic pressure is always lower than that of diastolic pressure.

Answer

(a) True

(b) False

24. Question

Name the two parts of a plant through which its gaseous waste products are released into the air.

Answer

Plant releases its gaseous waste products into the air through stomata, present in the leaves, and lenticels, present in the stems.

25. Question

What happens to the glucose which enters the nephron tubule along with the filtrate?

Answer

When glucose passes through the nephron tubule along with the glomerular filtrate, it gets collected in the Bowman's capsule.

26. Question

Name the two waste products of the human body which are produced in the body cells.

Answer

Carbon dioxide and urea are two waste products which are produced in the body cells of human beings.

27. Question

What is the role of glomerulus in the kidney?

Answer

Glomerulus, in the kidney, helps in the filtration of blood and resulting in urine formation.

28. Question

What is the other name of 'high blood pressure' ?

Answer

High blood pressure is also known as hypertension.

29. Question

Fill in the following blanks with suitable words :

(a) Gums and resins are the ..... products of plants.

(b) Bowman's capsule and tubule taken together make a.....

(c) The organs which extract the nitrogenous wastes from the blood are .....

(d) The extracellular fluid which always flows from body tissues to the heart is called.....

(e) The .....blood cells make antibodies whereas..... blood cells help in respiration.

Answer

(a) Waste.

(b) Nephron.

(c) Kidneys.

(d) Lymph.

(e) White, red.

Short Answer Type Questions-Pg-73

30. Question

What is xylem tissue? Name the two kinds of cells in xylem tissue. State whether these cells are living or dead.

Answer

Xylem is a conducting tissue of plants which carry water and minerals from the soils to the various of the plant body. Xylem is made up of xylem vessels and tracheids which are non-living cells.

31. Question

What is phloem tissue? Phloem contains two types of cells joined side by side. Name these two types of cells. State whether these cells are living or dead.

Answer

Phloem is a vascular tissue which transports food from leaves to the other parts of the plant. Phloem is made up of many cells joined end to end to form long tube. Phloem contains two type of cells which are associated with each other. These cells are sieve tubes and companion cell. Both cells are living.

32 A. Question

What is transpiration?

Answer

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

32 B. Question

What do you mean by 'translocation' with respect to transport in plants?

Answer

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

32 C. Question

Which plant tissue is involved in translocation : xylem or phloem ?

Answer

Phloem is a vascular tissue which transports food from leaves to the other parts of the plant.

33 A. Question

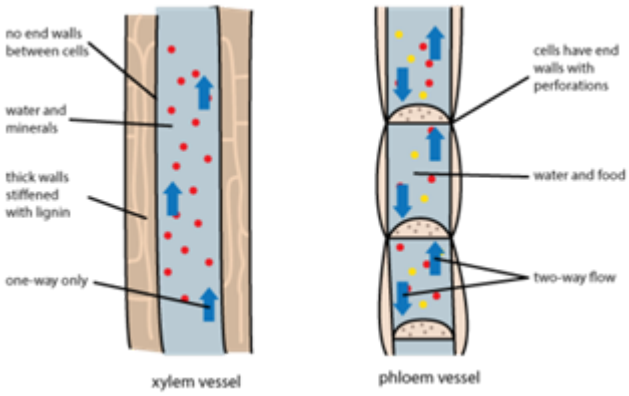
(a) Draw a labelled diagram of

(i) a xylem vessel, and

(ii) a sieve tube (or phloem).

Answer

(a) (i) and (ii)



33 B. Question

What are the differences between the transport of materials in xylem and phloem?

Answer

Differences between the transport of materials in xylem and phloem

Xylem	Phloem
It transports water and minerals from roots to the other parts of the plant.	It transports the food from leaves to the other parts of the plant.
It transports materials only in upward direction.	It transports materials in both the directions upward as well as downward.

34. Question

Match the terms in column I with their uses in column II

Column I	**Column II**
(i) Heart	(a) Pipes for transport in humans
(ii) Arteries and Veins	(b) Clotting of blood
(iii) Xylem vessels	(c) Pumping organ
(iv) RBC	(d) Water transport in plants
(v) Platelets	(e) Carrier of oxygen

Answer

(i) c **Explanation:** Heart is a pumping organ, its function is to pump blood from different parts of the body.

(ii) a **Explanation:** Arteries and Veins transport blood to different parts of the body.

(iii) d **Explanation:** Xylem vessels responsible for transport water in plant body.(iv) e **Explanation:** RBC(Red blood cells) found in blood is use to transport oxygen to different part of the body.(v) b **Explanation:** Platelets is responsible for Clotting of blood.

35. Question

Define excretion. Name the excretory unit of a kidney.

Answer

The biological process of removable of harmful metabolic wastes from the body of a living organism is called excretion.

The excretory unit of a kidney is called nephrons.

36 A. Question

What job is done by the kidneys ?

Answer

The kidneys are bean-shaped organs which filter the wastes from the blood by forming a yellowish liquid called urine.

36 B. Question

What do kidneys excrete?

Answer

Kidneys excrete urea from the body.

36 C. Question

What is the name of the tubes which connect the kidneys to bladder?

Answer

Each kidney enters a long tube called ureter which connects kidney to urinary bladder.

36 D. Question

What does the bladder in our body do?

Answer

Urinary bladder is a large muscular bag-like structure which stores the urine temporarily till it is excrete out.

37. Question

Why do some people need to use a dialysis machine ? What does the machine do?

Answer

Some people need to use a dialysis machine because one or both of their kidneys fail to work. Dialysis machine cleans the blood of a person by removing the nitrogenous wastes from the blood.

38. Question

What is the liquid part of the blood called? What is the function of platelets in the blood?

Answer

The liquid part of the blood is called plasma. The main function of platelets is to prevent bleeding. Platelets helps in the coagulation of blood (clotting of blood) in a cut or wound.

39 A. Question

How many types of blood vessels are there in the human body? Name them.

Answer

There are three types of blood vessels are found in human body. These are arteries, veins and capillaries.

39 B. Question

Why does the heart need valves?

Answer

Heart needs valves to prevent back flow of blood. Valves allow flow of blood in only one direction.

40. Question

A dialysis machine contains long tubes coiled in a tank containing dialysing

(i) Of what substance are the tubes made ?

(ii) What does the dialysing solution contain?

(iii) Name the main waste which passes into the dialysing solution.

Answer

(i) The tubes of dialysis machine are made up of semipermeable membrane (cellulose).

(ii) Dialysing solution contain water, glucose and salt.

(iii) The main waste is urea which passes into the dialysing solution.

41. Question

State the differences between artery, vein and capillary.

Answer

Artery

(i) Thick-walled blood vessel

(ii) Blood flows from the heart to different parts of the body

(iii) Blood flows with high pressure with a high speed

(iv) Valves are absent

Vein

• Thin walled blood vessel.

• Brings blood from the different parts of the body to the heart.

• Blood flows with low pressure and with a low speed.

• Contains valves which permit blood flow only towards the heart.

Capillary

• Thin walled and extremely narrow blood vessel.

• Capillary forms an extensive network throughout all living cells in the body.

• Capillaries connect arteries and veins.

• Valves are absent

42 A. Question

What are the upper parts of the heart called?

Answer

The upper part of the heart is called atria.

42 B. Question

What are the lower parts of the heart called?

Answer

The lower part of the heart is called ventricles.

42 C. Question

What is the name of blood vessels which connect arteries to veins?

Answer

Capillaries are thin-walled blood vessels which connect arteries to veins.

42 D. Question

(i) Which side of the heart pumps blood into the lungs ?

(ii) Which side of the heart pumps blood into entire body (except the lungs)?

Answer

(i) Right side of the heart pumps blood into the lungs.

(ii) Left side of the heart pumps blood into the entire body except the lungs.

43 A. Question

What are the methods used by plants to get rid of their waste products ?

Answer

There are various methods that are used by the plants to get rid of their waste products:

(i) Gaseous waste products are thrown out through the stomata, present on leaves and lenticels, present on stem of the plants.

(ii) Solid and liquid wastes are thrown out by shedding off leaves, peeling of bark and falling of fruits.

(iii) Plants excrete some waste products into the soil around them.

(iv) By secreting gums and resins.

43 B. Question

How are waste products excreted in Amoeba?

Answer

Amoeba is a unicellular organism which removes carbon dioxide from the body through its cell membrane by diffusion whereas it removes nitrogenous waste and water from the body by contractile vacuole.

41 A. Question

What is lymph? State two major functions of lymph.

Answer

Lymph is a colorless or slightly yellowish fluid. It is a medium of circulation in human body which flows only in one direction - from body tissues to the heart.

The functions of lymph are:

(i) Lymph helps in removing the waste products.

(ii) Lymph carries digested fat from the small intestine to the entire body.

(iii) Lymph nodes contain lymphocytes which kill the germs or foreign bodies.

44 B. Question

What is meant by saying that the blood pressure of a person is 120/80?

Answer

The blood pressure of a person is 120/80 which means that the systolic pressure is 120 mm Hg and diastolic pressure is 80 mm Hg.

45. Question

What is hypertension? Why is it caused? What harm can it do?

Answer

High blood pressure is also called hypertension. Hypertension is caused by the constriction of arterioles (small arteries), resulting in increased resistance to blood flow. Very high pressure can cause internal bleeding and rupturing of artery.

46. Question

What are the various components of blood? State their functions.

Answer

Blood is a red colour liquid which circulates in our body. The main components of blood are:

•Plasma

•RBC (Red blood cells)

•WBC (White blood cells), and

•Platelets

Functions:

•Plasma-It is liquid part of the blood. It contains about 90 percent water. Plasma carries dissolved substances like proteins, digested food, waste products, etc. one part of the body to the other parts.

•RBC : It carries oxygen from the lungs to all the cells of the body.

•WBC : Which blood cells (WBC) protect us from diseases. WBC make a chemical, antibodies which help to fight against infection.

•Platelets : The main function of platelets is to prevent bleeding. Platelets helps in the coagulation of blood (clotting of blood) in a cut or wound.

47. Question

With which human organ systems (or human systems) are the following associated?

(i) vena cava

(ii) glomerulus

(iii) alveoli

(iv) villi

Answer

(i) Vena cava is associated with human circulatory system.

(ii) Glomerulus is associated with human excretory system.

(iii) Alveoli is associated with human respiratory system.

(iv) Villi is associated with human digestive system.

48. Question

What is meant by 'systolic pressure' and 'diastolic pressure'? What are their normal values?

Answer

Systolic pressure: The pressure of blood inside the artery during ventricular systole (contraction) is called systolic pressure.

Diastolic pressure: The pressure of blood inside the artery during ventricular diastole (relaxation) is called diastolic pressure.

The normal value of systolic pressure is about 120 mm of Hg and the value of diastolic pressure is 80 mm of Hg.

49 A. Question

What is meant by 'heart beat' ? What is the usual heart beat rate at rest?

Answer

One heart beat includes one complete contraction (systole) and relaxation (diastole) of heart. The normal heart beat rate at rest is 72 times /minute.

(b) When a person runs for a while, his heart beat becomes faster because he needs more energy to run.

49 B. Question

What change occurs in heart beats if a person runs for a while? Why?

Answer

When a person runs for a while, his heart beat becomes faster because he needs more energy to run.

Long Answer Type Questions-Pg-74

50 A. Question

What is blood? Why is it red?

Answer

Blood is a red coloured fluid which circulates throughout the body. It consists of 55% plasma and 45% blood cells. Blood is red in colour because it contains a pigment called haemoglobin in its red cells (RBC).

50 B. Question

State the functions of blood in our body.

Answer

The functions of blood:

(i) Transport oxygen from the lungs to different parts of the body.

(ii) Transport CO_2 from the body tissues to the lungs.

(iii) Transport digested food i.e., glucose, amino acids, etc. from alimentary canal to various parts of the body for energy, growth and repair.

(iv) Transport excretory waste product called urea from the liver to the kidneys for removal as urine.

(v) Plasma regulates water balance in the body.

(vi) Regulates the body temperature.

50 C. Question

Name a circulatory fluid in the human body other than blood.

Answer

Lymph is a circulatory fluid in the human body other than blood.

51 A. Question

What is meant by human circulatory system? Name the organs of the circulatory system in humans.

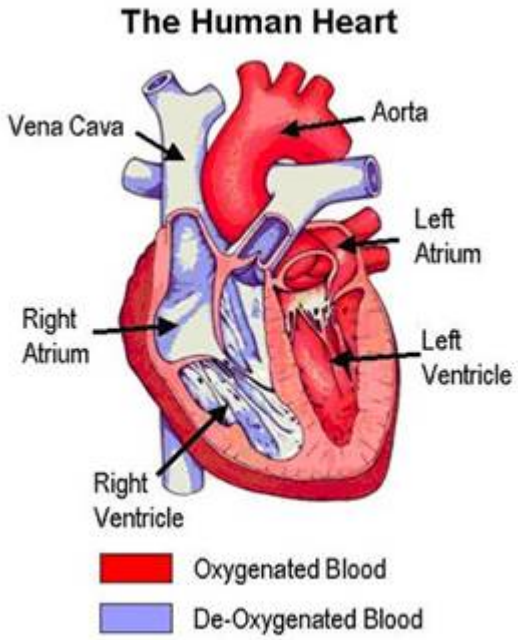
Answer

The organ system which is responsible for the transport of materials inside the human body is called human circulatory system. Heart is the main organ of the human circulatory system. The other organs of the human circulatory system include arteries, veins and capillaries.

51 B. Question

Draw a diagram of the human heart and label its parts.

Answer



51 C. Question

What is meant by the terms 'single circulation' and 'double circulation'?

Answer

In the case of single circulation, blood passes through the heart only once in one complete cycle of the body whereas in double circulation, blood passes through the heart twice in one complete cycle of the body.

52. Question

Describe the working of human blood circulatory system with the help of a suitable diagram which shows all the steps involved.

Answer

Following steps are included in the functioning of human circulatory system:

(i) The pulmonary vein brings the oxygenated blood from the lungs in the left atrium of the heart.

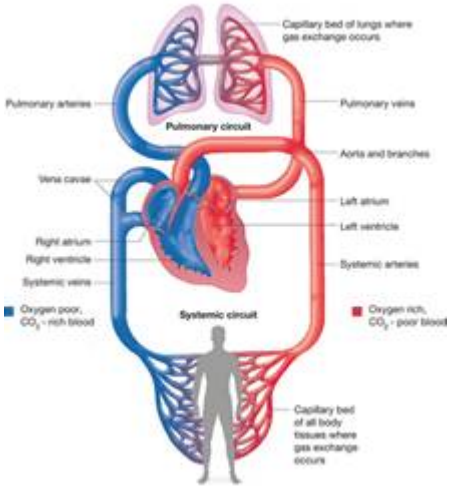
(ii) Left atrium contracts and pumps blood into the left ventricle through valve.

(iii) When the left ventricle contracts, the oxygenated blood enters the main artery called aorta. The blood travels from the main artery to larger and smaller arteries into the capillary network.

(iv) The aorta transports the blood to all the organs of the body except the lungs. The oxygenated blood releases oxygen, nutrients and other substances and takes on carbon dioxide and waste substances. The deoxygenated blood enters the vena cava which carry it to the right atrium of the heart.

(v) Right atrium pumps deoxygenated blood into the right ventricle through the valve.

(vi) When the right ventricle contracts, the deoxygenated blood enters the lungs through pulmonary artery and releases carbon dioxide and absorbs fresh oxygen from air. The blood becomes oxygenated again and is sent to the left atrium of heart by pulmonary vein for circulation in the body. This whole process is repeated continuously.



53 A. Question

Name the red pigment which carries oxygen in the blood.

Answer

Haemoglobin is a respiratory pigment, found in the red blood cells which carries oxygen in the blood.

53 B. Question

Why is it necessary to separate oxygenated and deoxygenated blood in mammals and birds?

Answer

Mammals and birds are warm-blooded animals. They require more energy to maintain their body temperature, so they require more oxygen to produce energy. Thus, it is necessary that their oxygenated blood get separated with deoxygenated blood.

53 C. Question

How many chambers are there in the heart of: (i) an amphibian, (ii) a mammal, and (iii) a fish?

Answer

(i) Thee chamber heart is found in amphibians.

(ii) Four chambered heart is found in mammals.

(iii) Two chambered heart is found in fishes.

53 D. Question

Describe the circulatory system in a fish.

Answer

Fish has a two-chambered heart-one atrium and one ventricle. In fish, heart pumps blood to the gills where oxygenation of blood takes place. The gills send the oxygenated blood to all the parts of the fish where oxygen is utilized and carbon dioxide enters into it making it deoxygenated. The deoxygenated blood is transported to the heart where it is pumped into the gills.

54 A. Question

What is lymphatic system ? What are its functions?

Answer

Lymphatic system is a system of tiny tubes called lymph vessels (lymphatics) and lymph nodes (lymph glands) in the human body which transports the liquid called lymph from the body tissues to the blood circulatory system.

The functions of lymphatic system are:

(i) It helps in removing the waste products.

(ii) It carries digested fat from the small intestine to the entire body.

(iii) Lymph nodes contain lymphocytes which kill the germs or foreign bodies.

54 B. Question

What is blood pressure? What are the two factors used to express the blood pressure of a person?

Answer

The pressure of blood which is exerted on the walls of blood vessels is called blood pressure. This pressure is much greater in the arteries than in the veins. The blood pressure of a person is always expressed by two factors - systolic pressure and diastolic pressure.

54 C. Question

Name the main nitrogenous waste in the human blood. How is it removed from the blood?

Answer

The main nitrogenous waste in the human blood is urea. It is removed from the blood by the kidney in the form of urine.

55 A. Question

Name the various organs of the human excretory system.

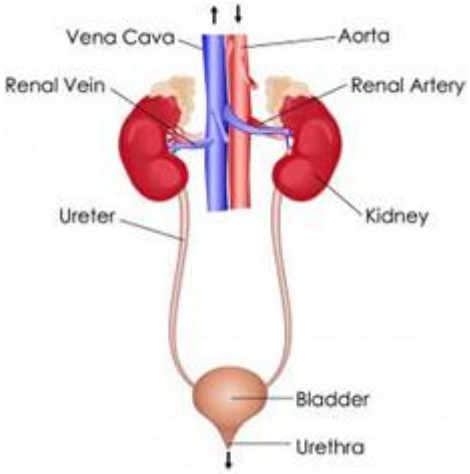
Answer

The excretory system of human beings consists: two kidneys, two ureters, a urinary bladder and a urethra.

55 B. Question

Draw a neat labelled diagram of the human excretory system.

Answer



55 C. Question

What is the function of excretory system in humans?

Answer

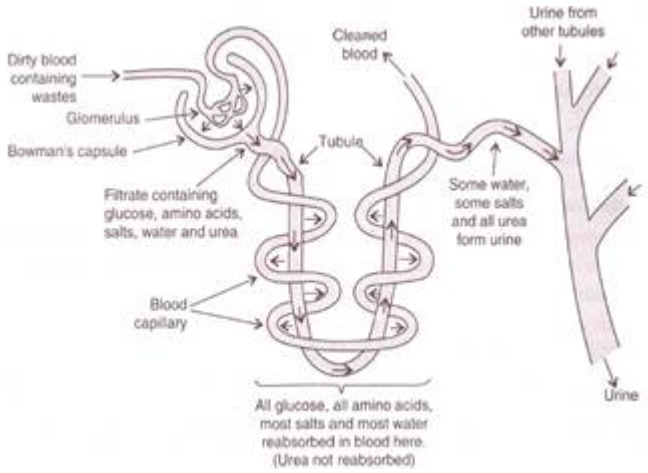
The primary function of excretory system, in humans, is to remove the nitrogenous wastes such as urea from the body and maintain mineral balance in the blood.

56 A. Question

Describe the mechanism of urine formation in human excretory system. Draw a labelled diagram to illustrate your answer.

Answer

Urine formation: Urine is formed inside the kidney in the nephron. Nephron is a functional unit of kidney. The blood containing waste like urea enters the glomerulus which filters the blood. Water, urea, and other salts like glucose are filtered out in renal tubule. The filtered fluid is called glomerular fluid. When the filtrate containing useful substances as well as the waste substances passes through the tubule, the useful substances like glucose, amino acids, most salts and water are reabsorbed into the blood through blood capillaries surrounding the tubule. Certain substances which are harmful and not needed by the body like urea, remain behind in the tubule. This yellowish liquid is called urine.



56 B. Question

Where is urine carried through ureters?

Answer

Ureters carry urine from kidneys to bladder.

56 C. Question

What is urethra?

Answer

Urethra is a muscular tube through which the urine collected in the urinary bladder is passed out from the body.

57 A. Question

What is meant by dialysis? What type of patients are put on dialysis ?

Answer

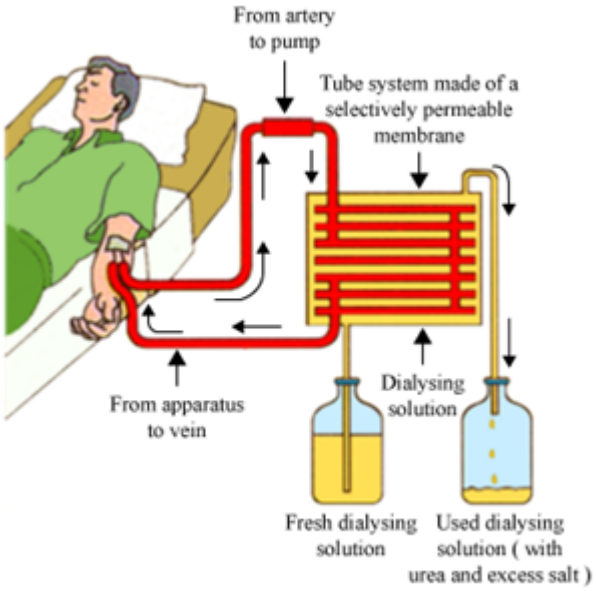
Dialysis is a procedure by which blood of a person is cleaned by separating the urea from it. The patients with kidney failure are put on dialysis.

57 B. Question

Explain the principle of dialysis with the help of a labelled diagram.

Answer

In the process of dialysis, the blood from an artery in the patient's arm is taken and is made to flow into the dialyser of a dialysis machine. The dialyser is made of long tubes of selective permeable membrane (like cellulose) which are coiled in a tank containing dialysing solution. The dialysing solution is a mixture of water, glucose and salts present in same concentrations as those of normal blood. As the blood passes through the dialysing solution most of the wastes like urea present in it pass through the selectively permeable cellulose tubes into the dialyzing solution. The purified blood is then pumped back into a vein of the patient's arm.



58 A. Question

Why is transport of materials necessary in an organism (plant or animal) ?

Answer

All living organisms (plant and animals) need water, food and oxygen for their survival and to perform various activities. They need to transport all these materials to various parts of their body.

58 B. Question

What is the need of special tissues or organs for transport of substances in plants and animals?

Answer

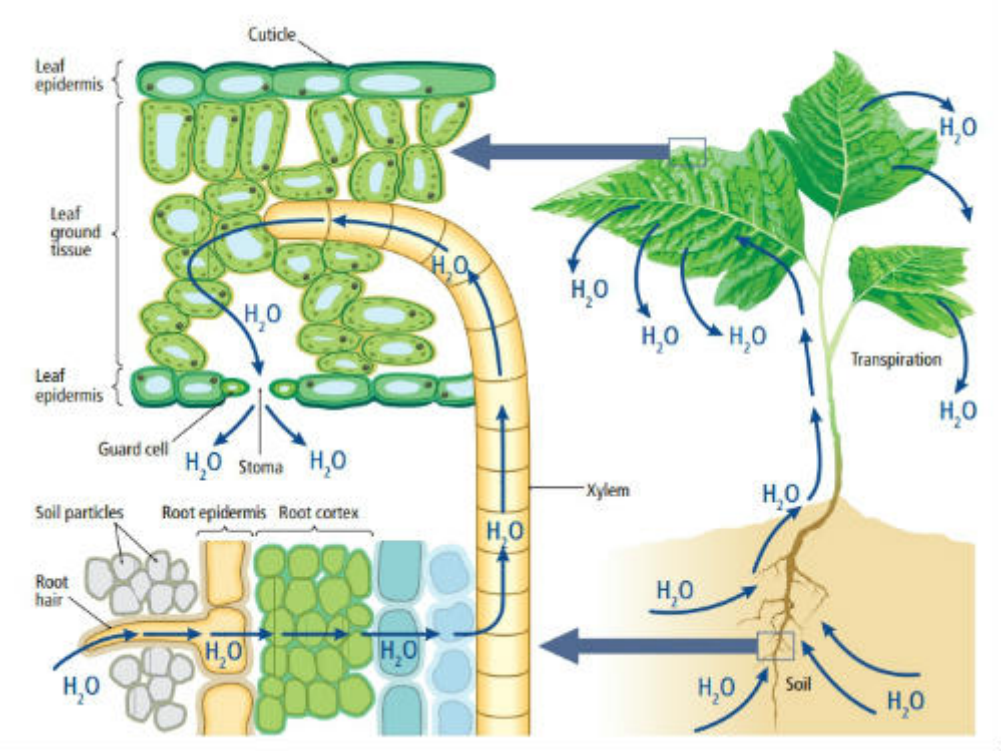
Plant and animals needs special tissue and organs for the transport of substances because essential substances like water, food and oxygen are made (or absorbed) in one part of the body and carried to other parts of the body.

58 C. Question

How are water and minerals transported in plants ?

Answer

Xylem tissue transports water and minerals in plants from the soil to leaves. Xylem vessels and tracheids are elements of xylem tissues. They are interconnected in roots, stem and leaves and form a continuous system of water-conducting channels reaching all parts of the plant. Plants take in water from the soil through the roots. The roots have root hairs to absorb water and minerals from the soil by diffusion. Each root hair is single-celled structure. The absorbed water and minerals passes from cell to cell by osmosis through epidermis, root cortex, endodermis and then reach the root xylem. The water enters the root xylem into the stem xylem and then reaches the leaves from the petioles.



58 D. Question

How is food transported in plants?

Answer

The food is manufactured in the leaves by photosynthesis and carried out from the leaves to the other parts of the plant. The transport of food from the leaves to other parts of the plant is called translocation. It is done through a vascular tissue called phloem. The translocation of food takes place in the living cells called sieve tubes with the help of the adjacent companion cells. The translocation of food in phloem takes place by utilizing energy. The food, prepare in the leaves, is loaded into the sieve tubes of the phloem tissue using energy ATP. The water now enters the sieve tube having sugar which causes high pressure and pushes the food to all the parts of the plant having low pressure. This allows the phloem to transport food according to the plant's needs.

Multiple Choice Questions (MCQs)-Pg-75

59. Question

One of the following does not have a nucleus. This one is :

A. red blood cell

B. white blood cell

C. guard cell

D. epidermal cell

Answer

Red blood cell red in colour because of the presence of a pigment called haemoglobin. It does not have a nucleus.

60. Question

The component 'of blood which makes chemicals known as antibodies is :

A. platelets

B. white blood cells

C. red blood cells

D. plasma

Answer

Which blood cells (WBC), a component of blood, protect us from diseases. WBC make a chemical, antibodies which help to fight against infection.

61. Question

An animal in which the oxygenation of blood does not take place in the lungs is :

A. cow

B. fish

C. frog

D. fox

Answer

Fish has gills to oxygenated its blood. The oxygenated blood is supplied from the gills to the body.

62. Question

Which of the following carries substances upwards as well as downwards in a plt ?

A. xylem

B. companion cells

C. phloem

D. tracheids

Answer

Phloem is a vascular tissue which transports food substances from the leaves to the other parts of the plant body. It transports in both the directions

upward as well as downward.

63. Question

One of the following is not a constituent of blood. This one is :

A. red blood cells

B. white blood cells

C. sieve plates

D. platelets

Answer

The blood is made up of plasma and blood cells (RBC, WBC and platelets). Sieve plate is a part of plant vascular system.

64. Question

If a patient is put on dialysis, he is most likely suffering from a severe ailment of the :

A. circulatory system

B. respiratory system

C. excretory system

D. digestive system

Answer

Some people need to use a dialysis machine because one or both of their kidneys fail to work. Dialysis machine cleans the blood of a person by removing the nitrogenous wastes from the blood.

65. Question

Water absorption through roots can be increased by keeping the potted plants :

A. in the shade

B. in dim light

C. under the fan

D. covered with a polythene bag

Answer

When we place a plant place under the fan, the speed of air flow is very high. Transpiration will take place in the presence of high air flow through the

stomata. The rate of transpiration increases during windy condition.

66. Question

A blood vessel which carries blood back to the heart is:

A. artery

B. vein

C. capillary

D. platelet

Answer

Vein is a thin-walled blood vessels which carries blood back to the heart.

67. Question

Blood is pumped from the heart to the entire body by the:

A. lungs

B. ventricles

C. atria

D. nerves

Answer

In human, heart has two ventricles-right ventricle and left ventricle. The function of ventricles is to pump blood from the heart to the entire body.

68. Question

The blood leaving the tissues becomes richer in :

A. carbon dioxide

B. water

C. haemoglobin

D. oxygen

Answer

The blood leaving the tissues becomes richer in carbon dioxide. When the oxygenated blood passes through the capillaries of the tissue, it gives oxygen to the body cells and takes carbon dioxide, produced during respiration. Thus, it becomes richer in carbon dioxide.

69. Question

What prevents the back flow of blood inside the heart during contraction?

A. thick muscular walls of ventricles

B. valves

C. thin walls of atria

D. all of the above

Answer

Valves prevent the backflow of blood inside the heart during contraction. They allow the flow of blood in only one direction.

70. Question

Which of the following is the correct path taken by urine in our body?

A. kidney → ureter → urethra → bladder

B. kidney → bladder → urethra → ureter

C. kidney → ureter → bladder → urethra

D. bladder → kidney → ureter → urethra

Answer

Urine formation takes place inside the kidney. Ureter carries urine from kidneys to bladder. Bladder stores the urine temporarily. Then the urine is discharged out of the body through urethra.

71. Question

In which of the following vertebrate group/groups, heart does not pump oxygenated blood to different parts of the body ?

A. pisces and amphibians

B. amphibians and reptiles

C. amphibians only

D. pisces only

Answer

In only pisces (fish) heart does not pump oxygenated blood to different parts of the body. The oxygenated blood is supplied from the gills to the body by dorsal aorta. Thus, in fish, heart receives only deoxygenated blood.

72. Question

Which vein brings clean blood from the lungs into the heart?

A. renal vein

B. pulmonary vein

C. vena cava

D. hepatic vein

Answer

Pulmonary vein brings oxygenated blood from the lungs into the heart.

73. Question

Which blood vessel does not carry any carbon dioxide ?

A. pulmonary artery

B. vena cava

C. hepatic vein

D. pulmonary vein

Answer

Pulmonary vein does not carry any carbon dioxide. It brings oxygenated blood from the lungs into the heart.

74. Question

It has been found that people living in very high mountains have many more red corpuscles in their blood than people living in plains. Which one of the following best accounts for this phenomenon?

A. the cold climate stimulates the production of red corpuscles to keep the body warm

B. people of high mountains breathe more quickly

C. the low air pressure requires more red corpuscles to supply the body cells with oxygen.

D. the low air pressure in high mountains speeds up the blood circulation so that more red corpuscles are needed

Answer

At higher altitudes, the atmospheric pressure is low and hence body doesn't get enough oxygen. This leads to many symptoms. More the number of RBC, more is the amount of oxygen that circulates in the body. Thus, to increase amount of oxygen, at low pressure, more RBC is required in the blood.

75. Question

The phloem tissue in plants is responsible for the transport of :

A. water

B. water and minerals

C. sugar

D. all of the above

Answer

Phloem is a vascular tissue which transports food materials from leaves to the other parts of the plant.

76. Question

Which of the following has a three-chambered heart?

A. pigeon

B. lizard

C. fish

D. lion

Answer

Cold blooded animals like amphibians and reptiles have three chambered heart.

77. Question

In which of the following are the largest amounts of nitrogen excreted from a mammalian body ?

A. breath

B. sweat

C. urine

D. faeces

Answer

Kidneys excrete the nitrogenous waste like urea from the body in the form of urine.

78. Question

Which one of the following has cytoplasm but no nucleus :

A. xylem vessel

B. sieve tube

C. tracheid

D. companion cell

Answer

The cells of phloem are called sieve tubes. These are living cells which contain cytoplasm but no nucleus.

79. Question

The process of carrying food from the leaves to other parts of a plant is called :

A. transpiration

B. transportation

C. translocation

D. transformation

Answer

The process by which phloem carries food from the leaves to other parts of a plant is called translocation.

80. Question

Which of the following is the only conducting tissue in non-flowering plants?

A. xylem vessels

B. sieve tubes

C. companion cells

D. tracheids

Answer

Tracheids are non-living cells which are present in all the plants but they are only water conducting tissue in non-flowering plants.

81. Question

Which of the following helps in the upward movement of water and dissolved minerals from the roots to the leaves through the stem ?

A. transportation

B. translocation

C. tropic movement

D. transpiration

Answer

Transpiration helps in the upward movement of water and dissolved minerals from the roots to the leaves through the stem

82. Question

Which one of the following does not have valves ?

A. heart

B. arteries

C. capillaries

D. veins

Answer

Capillaries are thin walled and extremely narrow blood vessels which do not have valves.

83. Question

Which of the following is accomplished in a plant by utilizing the energy stored in ATP?

A. transport of food

B. transport of water and minerals

C. transport of oxygen

D. transport of water, minerals and food

Answer

The translocation of food in the phloem takes place by utilizing the energy stored in ATP.

84. Question

Coagulation of blood in a cut or wound is brought about by :

A. plasma

B. platelets

C. WBC

D. RBC

Answer

The main function of platelets is to prevent bleeding. Platelets helps in the coagulation of blood (clotting of blood) in a cut or wound.

85. Question

The blood vessel which carries oxygenated blood from the lungs to the heart is :

A. main artery

B. pulmonary artery

C. main vein

D. pulmonary vein

Answer

Pulmonary vein carries oxygenated blood from the lungs to the heart.

86. Question

The instrument for measuring blood pressure is called :

A. manometer

B. sphygmomanometer

C. barometer

D. potentiometer

Answer

The blood pressure is measured with an instrument called sphygmomanometer.

87. Question

The excretory unit in the human excretory system is called:

A. nephron

B. neuron

C. nephridia

D. kidney

Answer

The functional unit of human excretory system is nephrons. Urine formation takes place in nephrons of kidneys.

88. Question

The substance which is not reabsorbed into the blood capillaries surrounding the tubule of a nephron is mainly :

A. glucose

B. amino acid

C. urea

D. water

Answer

As the glomerular filtrate passes through the tubular part of the nephron, the useful substances such as glucose, amino acids, salts and water are reabsorbed by the blood capillaries surrounding the nephron and only the waste substances such as urea and excess water remain behind in the tubule.

89. Question

The procedure of cleaning the blood of a person by using a kidney machine is known as:

A. ketolysis

B. hydrolysis

C. dialysis

D. photolysis

Answer

Dialysis is the procedure of cleaning the blood of a person by using a kidney machine.

90. Question

The excretory organs in an earthworm are:

A. nephridia

B. nephrons

C. raphides

D. ureters

Answer

In earthworm, excretory organs are nephridia.

91. Question

The cells in our blood which destroy disease-causing germs, are :

A. platelets

B. skin cells

C. RBCs

D. WBCs

Answer

Which blood cells (WBC), a component of blood, protect us from diseases. WBC make a chemical, antibodies which help to fight against infection.

92. Question

The wave of expansion of an artery when blood is forced into it is called :

A. flow

B. heart beat

C. pulse

D. ticking

Answer

Pulse is a wave of expansion of an artery when blood is forced into it.

93. Question

In autotrophs, water is transported through:

A. root hair

B. phloem

C. stomata

D. xylem

Answer

Xylem is a vascular tissue in plants which carries water and minerals from the roots to the various of the plant.

94. Question

An animal having double circulation in a three-chambered heart is:

A. fish

B. snake

C. deer

D. sparrow

Answer

Cold blooded animals like amphibians and reptiles have three chambered heart.

Questions Based on High Order Thinking Skills (HOTS)-Pg-76

95. Question

The transport system in plants consists of two kinds of tissues X and Y. The tissue X is made up of living cells and consists of two components A and B. The component A has tiny pores in its end walls and contains only cytoplasm but no nucleus. On the other hand, component B has cytoplasm as well as nucleus. The tissue Y is made up of dead cells and consists of two components C and D. The component C has open ends whereas component D does not have open ends. In flowering plants, either only C or both C and D transport water but D is the only water conducting tissue in non-flowering plants.

(a) What is (i) tissue X (ii) component A, and (iii) component B ?

(b) What is (i) tissue Y (ii) component C, and (iii) component D ?

Answer

(a) (i) Phloem (X)

(ii) Sieve tube (A) (iii) Companion cell (B)

(b) (i) Xylem (Y) (ii) Xylem Vessel (C) (iii)Tracheids (D)

96. Question

Water and dissolved minerals get into the root hair of a plant by a process called A and enter the conducting tissue B. The process C helps the water and dissolved minerals to move up through the tissue B in roots and stem, and reach the leaves of a plant. In the leaves food is made by a process D. This food is then transported to all the parts of a plant through tissue E. The process of distributing food made in the leaves to all the parts of the plant is called F.

(a) What are (i) A (ii) B (iii) C (iv) D (v) E, and (vi) F ?

(b) Which tissue is made up of living cells : B or E ?

(c) Which tissue, B or E, contains sieve tubes?

(d) Which tissue, B or E, contains tracheids ?

Answer

(a) (i) Diffusion (A) (ii) Xylem (B) (iii)Transpiration (C)

(iv) Photosynthesis (D)

(v) Phloem (E)

(vi) Translocation (F)

(b) E (c) E (d) B

97. Question

The liquid connective tissue A circulates in our body continuously without stopping. This tissue contains a pigment B which imparts it a colour C. The tissue A consists of four components D, E, F and G. The component D fights infection and protects us from diseases. The component E helps in the clotting of tissue A if a person gets a cut. The component F is a liquid which consists mainly of water with many substances dissolved in it and component G carries oxygen from the lungs to all the parts of the body.

(a) What is (i) tissue A (ii) pigment B, and (iii) colour C ?

(b) Name (i) D (ii) E (iii) F, and (iv) G.

(c) Name one substance (other than oxygen) which is transported by tissue A in the human body.

(d) Which two components of tissue A are the cells without nucleus ?

(e) Name any two organisms (animals) which do not have liquid like A in their body.

Answer

(a) (i) Blood (A) (ii) Haemoglobin (B) (iii)Red (C)

(b) (i) White blood cells (D) (ii) Platelets (E) (iii)Plasma (F) (iv) Red Blood Cells (G)

(c) Digested Food

(d) E (Platelets) and G (Red Blood Cells)

(e) Amoeba and Grasshopper

98. Question

The human body has an organ A which acts as a double pump. The oxygenated blood coming from the lungs through a blood vessel B enters the upper left chamber C of the double pump. When chamber C contracts, then blood goes into lower left chamber D. The contraction of chamber D forces the blood to go into a blood vessel E which supplies oxygenated blood to all the organs of the body (except the lungs). The deoxygenated blood coming out of the body organs is taken by a blood vessel F to the right upper chamber G of pumping organ. Contraction of Chamber G forces the deoxygenated blood into right lower chamber H. And finally the contraction of chamber H sends the deoxygenated blood into lungs through a blood vessel I.

(a) What is organ A ?

(b) Name the blood vessel (i) B (ii) E (iii) F, and (iv) I.

(c) What are chambers (i) C, and (i) D?

(d) What are chambers (i) G and (ii) H ?

Answer

(a) Heart (A)

(b) (i) Pulmonary Vein (B) (ii) Aorta (E) (iii) Vena cava (F)

(iv)Pulmonary artery (I)

(c) (i) Left atrium (C) (ii) Left ventricle (D)

(d) (i) Right atrium (G) (ii) Right ventricle (H)

99. Question

A liquid X of colour Y circulates in the human body only in one direction : from body tissues to the heart.

Among other things, liquid X contains germs from cells and dead cells. The liquid X is cleaned of germs and dead cells by a special type of white blood cells called Z. This cleaned liquid is then put into blood circulatory system in subclavian veins.

(a) What is (i) liquid X, and (ii) colour Y ?

(b) What are Z ?

(c) The liquid X is somewhat. similar to a component of blood. Name this component.

(d) Why is liquid X not red ? .

Answer

(a) (i) Lymph (X) (ii) Light yellow (Y)

(b) Lymphocytes (Z)

(c) Plasma (C)

(d) Lymph (X) does not contain red blood cells having the red pigment called haemoglobin.

100. Question

There is a pair of bean-shaped organs P in the human body towards the back, just above the waist. A waste product Q formed by the decomposition of unused proteins in the liver is brought into organ P through blood by an

artery R. The numerous tiny filters S present in organ P clean the dirty blood by removing the waste product Q. The clean blood goes into circulation through a vein T. The waste substance Q other waste salts, and excess water form a yellowish liquid U which goes from organ P into a bag-like structure V

through two tubes W. This liquid is then thrown out of the body through a tube X.

(a) What is (i) organ P, and (ii) waste substance Q ?

(b) Name (i) artery R; and (ii) vein T.

(c) What are tiny filters S known as?

(d) Name (i) liquid U (ii) structure V (iii) tubes W, and (iv) tube X.

Answer

(a) (i) Kidneys (P) (ii) Urea (Q)

(b) (i) Renal artery (R) (ii) Renal vein (T)

(c) Nephrons (S)

(d) (i) Urine (U) (ii) Bladder (V) (iii) Ureters (W) (iv)Urethra (X)

101. Question

The organs A of a person have been damaged completely due to which too much of a poisonous waste material B has started accumulating in his blood, making it dirty. In order to save this person's life, the blood from an artery in the person's arm is made to flow into long tubes made of substance E which are

kept in coiled form in a tank containing solution F. This solution contains three materials G, H and I in similar proportions to those in normal blood. As the person's blood passes through long tubes of substance E, most of the wastes present in it go into solution. The clean blood is then put back into a vein in the arm of the person for circulation.

(a) What are organs A ?

(b) Name the waste substance B.

(c) What are (i) E, and (ii) F ?

(d) Name G, H and I.

(e) What is the process described above known as?

Answer

(a) Organs A is Kidney.

(b) Waste substance (B) is urea.

(c) (i) Cellulose (E)

(ii) Dialysing solution (F)

(d) Water (G), Glucose (H) and Salts (I)

(e) Dialysis