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Very short answer

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

Answer

The basic requirement of living organisms for obtaining energy is food. Food gives us all kinds of nutrients like vitamins, minerals, proteins, carbohydrates and fats. These vital nutrients help the body to function efficiently. Hence the body will be stable physically and mentally. Hence, food is the basic requirement of living organisms for obtaining energy is food.

2. Which of the following types of energy is used by living organisms to perform vital life processes?

Kinetic energy, Chemical energy, Potential energy, Nuclear energy

Answer

Chemical energy is used by living organisms to perform vital life processes. In all the living organisms whatever the process takes place is all based on this chemical energy. For instance, the food which we eat is digested and then gets converted into required sugar (glucose and fructose). These sugars are nothing but the chemical compounds which bind all the cells and tissues together. Hence, chemical energy is used by living organisms to perform vital life processes.

3. Which of the following is an autotroph?

Green plant or Man

Answer

An autotroph is an organism that produces its own food from the raw materials available in its surroundings. The word autotroph comes from the root words auto for self and troph for food. Here, Green plant is an autotroph. Because a green plant prepares its own food from raw materials like sunlight, chlorophyll, carbon dioxide and water.

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

Answer

Autotrophs make their own food by the process of photosynthesis. The process by which plants make their own food using raw materials like sunlight, chlorophyll, water and carbon dioxide is called photosynthesis. The two inorganic substances used by autotrophs to make food are carbon dioxide and water.

5. What is the mode of nutrition in fungi?

Answer

The mode of nutrition in fungi is saprotrophic. In saprotrophic mode of nutrition, the vital nutrients required for their body are collected from dead and decaying matter. The other organisms which are saprotrophic is Rhizopus, Yeast, and Mushroom.

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

Answer

Saprophytic: The mode of nutrition in which organisms feed on dead and decaying matter.

Parasitic: The mode of nutrition in which organisms feed themselves by depending on the host or on other living organisms.

Holozoic: The mode of nutrition in which the digestion of food is allowed only after the ingestion of food.

An organism having the following modes of nutrition are:

Saprophytic - Fungi

Parasitic - Plasmodium

Holozoic - Human Beings

7. Name the process by which plants make food.

Answer

The process by which plants make food is photosynthesis. Photosynthesis is the process in which green plants use sunlight to make their own food. Photosynthesis requires sunlight, chlorophyll, water, and carbon dioxide gas. Chlorophyll is a substance in all green plants, especially in the leaves. Plants take in water from the soil and carbon dioxide from the air.

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

Answer

The process by which plants make food is photosynthesis. Photosynthesis is the process in which green plants use sunlight to make their own food. The two other conditions necessary for the process of photosynthesis to take place are sunlight and chlorophyll.

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

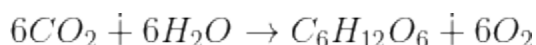
Answer

Apart from sunlight and chlorophyll, plants require carbon dioxide and water to make food by photosynthesis. The process by which plants make food is photosynthesis. Photosynthesis is the process in which green plants use sunlight to make their own food. Photosynthesis requires sunlight, chlorophyll, water, and carbon dioxide gas. Chlorophyll is a substance in all green plants, especially in the leaves. Plants take in water from the soil and carbon dioxide from the air.

10. (A) Name a gas used in photosynthesis.**(b) Name a gas produced in photosynthesis**

Answer

We all know that photosynthesis is a process in which green plants use sunlight to make their own food. Photosynthesis requires sunlight, chlorophyll, water, and carbon dioxide gas. The reaction involved in photosynthesis is:



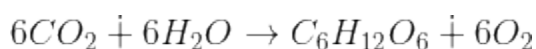
(a) The gas used in photosynthesis is carbon dioxide.

(b) The gas produced in photosynthesis is oxygen.

11. 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

Photosynthesis is a process in which green plants use sunlight to make their own food. Photosynthesis requires sunlight, chlorophyll, water, and carbon dioxide gas. The reaction involved in photosynthesis is:



The glucose formed in the above reaction is converted into starch and then is used by the plant for supplying energy to the plants.

Hence here A is Glucose and B is starch.

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

Answer:

During the photosynthesis experiment ethanol, which is an alcohol, is used to remove chlorophyll. In this experimental procedure ethanol reacts with the leaf and automatically decolorizes the leaf. Hence the green pigment chlorophyll gets removed from the leaf and the experiment then proceeds

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

Answer

We boil the leaf in alcohol when we are testing it for starch because to remove the green pigment chlorophyll present in it. For the starch test we need to observe the color change from brown to blue when iodine is put on the leaf. But, initially the leaf is green in color which does not show the required observation. Hence to remove the green pigment present in the leaf we boil the leaf in alcohol when we are testing it for starch.

14. (a) Name the pigment in leaves which absorbs sunlight energy.

(b) What is the color of this pigment?

Answer

(a) The pigment in leaves which absorbs sunlight energy is chlorophyll.

During the process of photosynthesis all the parts of the plant are involved in this process. The root system and the shoot system both are involved. The shoot system of the plant includes the stem and leaves of the plant. As we all know that the photosynthesis process is carried out in the presence of sunlight. The pigment called chlorophyll has the ability to absorb sunlight's energy. These are present in the chloroplast of the plant cell.

(b) The color of the pigment is green. It is the photosynthetic pigment present in leaves. It is used in providing oxygen to plants and also plays a vital role in the process of photosynthesis. It absorbs all the radiations of variant colors like violet, blue, orange and red. But it reflects the green light and hence the leaves appear green in color.

15. Name the pigment which can absorb solar energy.

Answer:

Chlorophyll is a pigment that can absorb solar energy in plants. It is present in the leaves of the plant. To be specific, these are situated in the chloroplast of the plant cell. It is the vital photosynthetic pigment in leaves as it involves the conversion of light energy into chemical energy. It absorbs all the

radiations of variant colors like violet, blue, orange and red. But, it reflects the green light and hence the leaves appear green in color. It absorbs the solar energy varying from the wavelength around 430nm (blue) to 662nm (red). Other than plants these are also present in some other organisms like bacteria and green algae.

16. Name the organelle of plant cells in which photosynthesis occurs.

Answer

The organelle of plant cells in which photosynthesis occurs is the chloroplast of plant cells. The photosynthetic pigment, chlorophyll is present in the chloroplast of the cell. It helps to absorb the solar energy. It converts the light energy into chemical energy and helps in the process of photosynthesis. The chloroplast organelle is present on the leaves of the plant.

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

Answer

The four other raw materials which are needed by the plants are Nitrogen, Phosphorous, Iron and Magnesium. These are the other vital nutrients required for the plant's growth and stability. These help in the formation of new cells which further leads to the development of plant tissue. Nitrogen is the major component of amino acid and is also building blocks of protein. Phosphorus helps in the conversion of light energy into chemical energy. Iron is involved in the synthesis of chlorophyll and also for the maintenance of chloroplast structure and function. Magnesium is the central atom of chlorophyll molecule and is a building block of the green pigment in plants.

18. Where is chlorophyll mainly present in a plant?

Answer

Chlorophyll is a pigment that can absorb solar energy in plants. It is present in the leaves of the plant. To be specific, these are situated in the chloroplast of the plant cell. It is the vital photosynthetic pigment in leaves as it involves the conversion of light energy into chemical energy. It is the photosynthetic pigment present in leaves. It is used in providing oxygen to plants and also plays a vital role in the process of photosynthesis.

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

Answer

The cells in the leaf of a plant that control the opening and closing of stomata are guard cells. These cells are in bean shape and surround the stoma. These are the epidermal cells and help in exchange of gases by opening and closing of stomata. These also play a major role in transpiration and minimal loss of water. Light is a major aspect of these guard cells.

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

Answer

Amoeba is an organism whose process of obtaining food is called phagocytosis. Phagocytosis is a process by which certain living cells called phagocytes ingest or engulf other cells or particles. These may be either unicellular organisms like amoeba or our white blood cell.

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

Answer

Animals can be divided into three groups on the basis of their eating habits are:

- (i) **Herbivores:** The animals which feed on plants, leaves, fruits and other natural products for their food are called herbivores. Example: cow, goat, sheep, etc.
- (ii) **Carnivores:** The animals which feed on other animals for their food are called carnivores. Example: Lion, Cat, Shark, etc.
- (iii) **Omnivores:** The animals which feed on both plants and animals for their food are called omnivores. Example: Rats, Pigs, Bear etc.

22. 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) Only meat eaters: Carnivores - The animals which feed on other animals for their food are called carnivores. Example: Lion, Cat, Shark, etc.
- (ii) Only plant eaters: The animals which feed on plants, leaves, fruits and other natural products for their food are called herbivores. Example: cow, goat, sheep, etc.
- (iii) Both, plant and meat-eaters: The animals which feed on both plants and animals for their food are called omnivores. Example: Rats, Pigs, Bear etc.

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

Answer

The green pigment present in the leaves of a plant is chlorophyll. Chlorophyll is a pigment that can absorb solar energy in plants. To be specific, these are situated in the chloroplast of the plant cell. It is the vital photosynthetic pigment in leaves as it involves the conversion of light energy into chemical energy. It is used in providing oxygen to plants and also plays a vital role in the process of photosynthesis.

24. 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 is Ingestion, digestion, absorption, assimilation and egestion.

Ingestion is the process the food is taken inside through mouth and broken down by teeth and initial digestion takes place in the mouth by saliva.

Digestion is the process in which food is digested by using few enzymes and is used by the cells for producing energy.

Absorption is the process in which cells use the energy from the digested food and helps in building tissues in our body.

Assimilation is the process in which digested food moves into the cells of the body.

Egestion is the process in which undigested food is removed out from the body through excretion.

25. How does Amoeba engulf the food particle?

Answer

Endocytosis is a process by which amoeba engulfs its food. Amoeba has a flexible membrane and finger-like projections called pseudopodia. Pseudopodia forms a vacuole around it and helps in engulfing the food. When the food particle is completely trapped inside its vacuole amoeba secretes its

digestive enzymes and digests the food.

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

Answer

The digestive enzymes are secreted into the food vacuole in amoeba to break down the food. The enzymes act on food particles in the food vacuole and breakdown into simpler molecules by chemical reaction which are soluble in its body.

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

Answer

The process of removal of undigested food from the body is called egestion. When a sufficient amount of undigested gets collected in the food vacuole, it is thrown out of the body by rupturing the cell membrane.

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

Answer

Paramecium is a unicellular animal which uses cilia to move food particles into its mouth. Cilia is present throughout the body and continuously push the food particles along the water current to mouth.

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

Answer

Salivary amylase is the enzyme present in human saliva. It helps in the digestion of starch. It is which is capable of breaking down starch into simpler sugars such as maltose and dextrin that can be further broken down in the small intestine. About thirty percent of digestion takes place in the mouth cavity.

30. Which of the organs perform the following functions in humans?

(i) Absorption of food

(ii) Absorption of water

Answer

(i) Absorption of food: The process of absorption of food takes place in the small intestine. The inner wall of the small intestine contains small finger-like projections called Valli. These projections help in the digestions of food.

(ii) Absorption of water: The process of absorption of water takes place in the large intestine. In this process the waste material is compressed and dehydrated to form feces.

31. What moves the food in the digestive organs?

Answer

Peristaltic movement moves the food in the digestive system. The contraction and relaxation of muscles of the esophagus, intestine and stomach is called peristaltic movement. The movement is involuntary and is mandatory for the movement of food from mouth and bowels through anus.

32. What is another name of the food pipe?

Answer

Another name of the food pipe is the esophagus. Scientifically it is termed as esophagus but in common language it is named as food pipe or gullet. It is the organ through which food passes from mouth to stomach. The length of the food pipe is around 10 inches or 25 centimeters.

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

Answer

The substance which gets mixed with the food in the mouth during chewing by teeth is saliva. It acts as digestive juice and softens the food, which further leads to the easy process of digestion. It is secreted by salivary glands. It plays a vital role in lubricating our mouth.

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

Answer

The tiny projections on the inner surface of the small intestine which help in absorbing the digested food are called villi. These help to increase the surface area of intestinal walls. The increase in surface area helps in the absorption of nutrients easily.

35. In which part of the digestive system is water absorbed?

Answer

The large intestine is the part of the digestive system in which water is absorbed. The large intestine also helps to change the waste from liquid into stool. Peristalsis helps move the stool into your rectum.

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

Answer

The anus is the opening in the human body through which undigested food is thrown out. Anus is the last part of the digestive system. The anus is surrounded by sphincter muscles that are important in allowing control of stool.

37. Where is digested food absorbed into blood in the human body?

Answer

The digested food is absorbed into the blood in the human body by the small intestine. The digested food passes through the walls of the small intestine and then into our bloodstream. Here the digested food is broken down into vitamins, minerals, proteins, carbohydrates and fats. These all nutrients are reached to different cells and tissues by means of blood.

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

Answer

Digestive enzymes are the biological catalysts that bring about chemical digestion of food. These enzymes are pepsin, trypsin, lipase, protease and amylase which helps in the chemical digestion of food. They break down the complex molecules into simpler ones and make it easier for digestion.

39. 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.

An autotroph is an organism that produces its own food from the raw materials available in its

surroundings.

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

A heterotroph is an organism that cannot produce its own food, instead of taking nutrition from other sources of organic carbon, mainly plant or animal matter.

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

An autotroph is an organism that produces its own food from the raw materials available in its surroundings. Example Plants. A heterotroph is an organism that cannot produce its own food, instead of taking nutrition from other sources of organic carbon, mainly plant or animal matter. Example Animals and human being

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

Photosynthesis is a process in which green plants use sunlight to make their own food. Photosynthesis requires sunlight, chlorophyll, water, and carbon dioxide gas.

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

In the Iodine test, Iodine dissolved in an aqueous solution of Potassium Iodide (KI) reacts with starch producing a bluish color.

Short answer type questions:

40. (a) What is chlorophyll? What part does chlorophyll play in photosynthesis?

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

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

Answer

(a) Chlorophyll is the green pigment present in the leaves. These are mainly located in chloroplast of the plant cells. Chlorophyll plays a major role in photosynthesis. It helps in the conversion of absorbed light energy into chemical energy. This conversion helps in the preparation of food in plants.

(b) (i) Glucose is the simple food which is prepared first in the process of photosynthesis. Glucose and oxygen are the final products of photosynthesis.

(ii) Starch is the food that gets stored in plant leaves. Starch is a polymeric carbohydrate consisting of a large number of glucose units linked by glycosidic bonds. It acts as stored energy in plants.

41. (a) What criteria can be used to decide whether something is alive?

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

Answer

(a) The criteria which can be used to decide whether something is alive is any basic movement like breathing, growing or walking. Some movements are not visible to the naked eye like the beating of the heart. This also decides if the person is alive or not.

(b) The basic essential activities performed by a living organism to sustain its life on this planet earth is called life processes. The basic life processes common to all living organisms which are essential for maintaining life are nutrition, respiration, digestion, excretion, growth and reproduction.

42. (a) What are autotrophs? Give one example of autotrophs.

(b) What are the conditions necessary for autotrophic nutrition?

Answer

Autotrophs are organisms that produce their own food from the raw materials available in their

surroundings. The meaning is derived from the word itself: Auto + troph = self + food. Plants are the best example of autotrophs.

(b) The conditions necessary for autotrophic nutrition are carbon dioxide, water, chlorophyll and water.

43. (a) What are heterotrophs? Give one example of heterotrophs.

(b) What is the difference between autotrophic nutrition and heterotrophic nutrition?

Answer

(a) Heterotrophs are those organisms which completely depend on others for their nutrition. They depend on surrounding plants and animals for food. They cannot make the food from available inorganic substances like carbon dioxide, water and sunlight. The examples of heterotrophs are animals, Homo sapiens.

(b)

Autotrophic nutrition	Heterotrophic nutrition
The mode of nutrition in which the organisms prepare their own food from the available inorganic materials like carbon dioxide, water, sunlight and chlorophyll from their surroundings is called autotrophic nutrition.	The mode of nutrition in which the organisms cannot prepare their own food from the available inorganic materials like carbon dioxide, water, sunlight and chlorophyll from their surroundings is called heterotrophic nutrition.
Example: Plants	Example: Animals

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

(b) What are the various types of heterotrophic nutrition?

Answer

(a) Nutrients are the substances that provide energy to the body in building up the cells and tissues of the organism. There are two kinds of nutrients: Micronutrients (which are required in small amounts by the body) and Macronutrients (which are required in large amounts by the body). The four important nutrients present in our food are carbohydrates, fats, vitamins and minerals.

(b) The various types of heterotrophic nutrition are:

Saprophytic: The mode of nutrition in which organisms feed on dead and decaying matter. Example Fungi

Parasitic: The mode of nutrition in which organisms feed themselves by depending on host or on other living organisms. Example Leeches

Holozoic: The mode of nutrition in which the digestion of food is allowed only after the ingestion of food. Example Dogs.

45. (a) Photosynthesis converts energy X into energy Y. What are X and Y?

(b) State the various steps involved in the process of photosynthesis.

Answer

(a) Photosynthesis is a process in which green plants use sunlight to make their own food.

Photosynthesis requires sunlight, chlorophyll, water, and carbon dioxide gas. The chlorophyll present in leaves absorb light energy from the sun and convert into chemical energy.

So here X is light energy and Y is chemical energy.

(b) The various steps involved in the process of photosynthesis are:

- Absorption of light energy through the sun by chlorophyll present in leaves.
- Conversion of light energy chemical energy. In this process, the water molecule splits into its respective components hydrogen and oxygen.

- Carbon dioxide is reduced into carbohydrates like glucose by light energy utilizing the hydrogen and oxygen produced in the above step.

46. (a) How do plants obtain food?

(b) Why do plants need nitrogen? How do plants obtain nitrogen?

Answer

(a) Plants obtain food by the process of photosynthesis. Photosynthesis is a process in which green plants use sunlight to make their own food. Photosynthesis requires sunlight, chlorophyll, water, and carbon dioxide gas.

(b) Plants need nitrogen because it is the major component of amino acid and is also building blocks of protein. Plants obtain nitrogen from the soil by inorganic salts like nitrites or nitrates in the form of organic compounds produced by bacteria using the atmospheric nitrogen. Plants also obtain nitrogen from the NPK fertilizer.

47. Define (i) saprophytic nutrition (ii) parasitic nutrition, and (iii) holozoic nutrition. Give one example of each type.

Answer

(i) Saprophytic Nutrition: The mode of nutrition in which organisms feed on dead and decaying matter.

Example Fungi

(ii) Parasitic nutrition: The mode of nutrition in which organisms feed themselves by depending on the host or on other living organisms. Example Leeches

(iii) Holozoic nutrition: The mode of nutrition in which the digestion of food is allowed only after the ingestion of food. Example Dogs.

48. Define (i) Saprophyte and (ii) Parasite. Name two saprophytes and two parasites.

Answer

(i) Saprophyte: These are the organisms that depend on dead and decaying matter of plants and animals for their nutrition.

(ii) Parasite: These are the organisms which feed on other living organisms called host for their nutrition.

The two saprophytes are: Yeast and fungi.

The two parasites are: Cows and pigs.

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

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

Answer

(a) Carbon dioxide from the air enters the leaves of a plant to be used in photosynthesis by the small pores present on the leaves called stomata. Stomata are the tiny pores on the leaves which play a major role in the exchange of gases. The intake of carbon dioxide and the outgoing of oxygen both takes place through these pores.

(b) The water from the soil reaches the leaves by the tissue called Xylem. The root hairs on the root absorb water from the soil and through osmosis the water is transported to leaves through the tissue xylem. Xylem is the fundamental tissue for the transportation of water in plants.

50. What substance are contained in gastric juice? What are their functions?

Answer

The substance contained in gastric juice is: Hydrochloric acid, enzyme pepsin, and mucus.

These substances perform the following functions:

Hydrochloric acid: It creates a medium of gastric juice acidic so that the enzyme pepsin digests the protein and kills the bacteria present in them.

Pepsin: The enzyme pepsin digests the protein and breaks down into smaller molecules.

Mucus: The mucus helps to protect the inner layer of the stomach from the secretion of hydrochloric acid.

51. What substance are contained in pancreatic juice? What are their functions?

Answer

The substances contained in pancreatic juice are: Pancreatic amylase, trypsin, and lipase.

These substances perform the following functions:

Pancreatic amylase: Amylase helps in the conversion of starch into maltose. This helps in the breakdown of polysaccharide into glucose, maltose and other simpler products.

Trypsin: Trypsin is an enzyme that helps us digest protein. In the small intestine, the enzyme breaks down into proteins, and continues the process of digestion that began in the stomach.

Lipase: It is an enzyme that breaks down dietary fats into smaller molecules called fatty acids and glycerol. This enzyme specifically digests butterfat in the food.

52. (a) What is the role of hydrochloric acid in our stomach?

(b) What is the function of enzymes in the human digestive system?

Answer

(a) Hydrochloric acid plays a major role in the process of digestion. It creates a medium of gastric juice acidic so that the enzyme pepsin digests the protein and kills the bacteria present in them. Hydrochloric acid helps your body to break down, digest, and absorb nutrients such as protein.

(b) The enzymes play a lead role in the human digestive system. The enzymes help to breakdown the larger complex molecule into smaller ones like vitamins, proteins and minerals. It also helps to break down dietary fats into smaller molecules. These also help in speeding the digestion process.

53. (a) Which part of the body secretes bile? Where is bile stored? What is the function of bile?

(b) What is trypsin? What are its functions?

Answer

(a) Liver secretes bile juice. Bile is stored in the gall bladder. The functions of bile are:

- Bile juice breaks the complex fat molecules into simpler ones which helps the enzymes to act easily and the process of digestion becomes simpler.
- It also makes the acidic food coming from stomach alkaline so that the pancreatic enzymes can act easily on it.

(b) Trypsin is a pancreatic enzyme. Trypsin has a key role in the small intestine. In the small intestine, the enzyme breaks down into proteins, and continues the process of digestion that began in the stomach.

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

Answer

The main function of the liver is to process the nutrients absorbed from the small intestine. It also helps in the secretion of bile juice. It also helps in enzyme activation and removal of other components like

bilirubin, cholesterol and drugs.

The pancreas plays a key role in producing pancreatic enzymes. These enzymes help to digest protein and dietary fats which are essential for an organism. It also helps in endocrine function that regulates the blood sugar.

55. Match the organisms given in column I with the processes given in column II:

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) Leech - Parasitic Nutrition
- (ii) Amoeba - Holozoic Nutrition
- (iii) Mushroom- Saprophytic Nutrition
- (iv) Green plant – Autotrophic Nutrition

56. 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 stomata pore.

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

Answer

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

(b) Organisms that cannot prepare their own food: Heterotrophs

(c) Organisms that can prepare their own food: Autotrophs

(d) The cell organelle where photosynthesis occurs: Chloroplast

(e) The cells which surround a stomata pore: Guard cells

(f) An enzyme secreted by gastric glands in the stomach which acts on proteins: Pepsin

57. 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) Trypsin: Pancreas
- (ii) Amylase: Saliva
- (iii) Bile: Liver
- (iv) Pepsin: Gastric glands

58. (a) What is the common for Cuscuta, ticks and leeches?

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

(i) Trypsin (ii) Amylase (iii) Pepsin (iv) Lipase

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

Answer

(a) The common feature in Cuscuta, ticks and leeches is they all undergo parasitic mode of nutrition. In this mode of nutrition the organisms feed themselves by depending on the host or on other living organisms.

(b) (i) Trypsin: The trypsin enzyme acts on the proteins. In the small intestine, the enzyme breaks down into proteins, and continues the process of digestion that began in the stomach.

(ii) Amylase: The amylase enzyme acts on starch. Amylase helps in the conversion of starch into maltose. This helps in the breakdown of polysaccharide into glucose, maltose and other simpler products.

(iii) Pepsin: The Pepsin enzyme acts on the proteins. An enzyme secreted by gastric glands in the stomach which acts on proteins.

(iv) Lipase: The enzyme lipase acts on fats. It is an enzyme that breaks down dietary fats into smaller molecules called fatty acids and glycerol. This enzyme specifically digests butterfat in the food.

(c) Absorption of digested foods occurs mainly in the small intestine due to the presence of a large number of finger-like projections called villi. These projections absorb the protein molecules and help in the transfer of the proteins to all cells and tissues.

59. (a) Why is the small intestine in herbivores longer than in carnivores?

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

(c) What causes movement of food inside the alimentary canal?

Answer

(a) The animals which feed on plants, leaves, fruits and other natural products for their food are called herbivores. Example: cow, goat, etc. The animals which feed on other animals for their food are called carnivores. Example: Lion, Cat, etc. Herbivores feed only on plants hence they need longer small intestine to digest the cellulose present in plants. Carnivores feed on other animals and the food gets digested easily as compared to herbivore. Hence small intestine in herbivores longer than in carnivores.

(b) If the mucus is not secreted by gastric glands then the hydrochloric acid produced in the gas will damage the inner lining of the stomach and leads to ulcers in the stomach.

(c) Peristaltic movement moves the food in the alimentary canal. The contraction and relaxation of

muscles of the esophagus, intestine and stomach is called peristaltic movement. The movement is involuntary and is mandatory for the movement of food from mouth and bowels through anus.

60. (a) How do guard cells regulate the opening and closing of stomatal pores?

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

Answer

- (a) The guard cells regulate the opening and closing of stomatal pores by the osmosis process. When water flows into the guard cells, they swell up and the curved surface causes the stomata to open. When the guard cells lose water, they shrink and become flaccid and straight thus closing the stomata.
- (b) Plants kept in continuous light will live longer because the light helps in the process of photosynthesis and also exchange of gases takes place easily. The respiration process takes place and hence the plant in continuous light will live longer.

61. (a) What would happen if all the green plants disappear from the earth?

(b) 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

- (a) If all the green plants disappear from the earth then all the organisms like herbivores, carnivores and omnivores would starve for food. All the animals will not get oxygen for breathing and life without plants would be very difficult. All the life forms will die ultimately without the green plants. All the life forms on earth are dependent on plants directly or indirectly. Hence we need to conserve the green plants and survive peacefully.
- (b) Plants carry out respiration throughout the day and night like other living beings. Hence, they keep on emitting carbon dioxide all the time. Photosynthesis takes place only in the presence of light and hence, oxygen is released by plants only during the day.

62. a) Leaves of a healthy potted plant were coated with Vaseline. Will this plant remain healthy for long? Give reasons for your answer.

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

(i) Cloudy day in the 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

- (a) The plant will not remain healthy for long because the Vaseline coating blocks the stomatal pores present on the leaves. Due to this blockage the exchange of gases does not take place in plants. The transpiration process will not continue and the plants cannot remove excess of water present in them. The photosynthesis process will not occur as the pores are closed and light cannot pass through the leaves.
- (b) (i) The rate of photosynthesis in a plant decreases in the morning but increases in the afternoon during cloudy day in the morning but bright sunshine in the afternoon. As the rate of absorption of sunlight during sunshine is more.

- (ii) The rate of photosynthesis in a plant decreases when there is no rainfall in the area for a considerable time. The plants get dried due to the loss of water.
(iii) The rate of photosynthesis in a plant decreases when the dust is gathered on leaves as it covers the stomatal pores and the exchange of gases does not take place.

Long answer type questions

63. (a) What is photosynthesis?

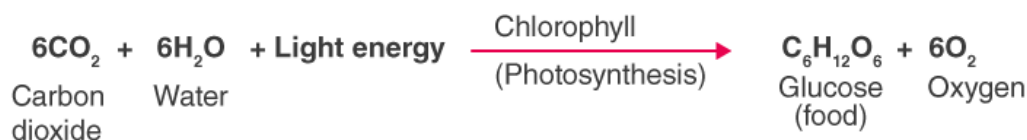
(b) Write a chemical equation to show the process of photosynthesis in plants.

(c) Explain the mechanism of photosynthesis.

Answer

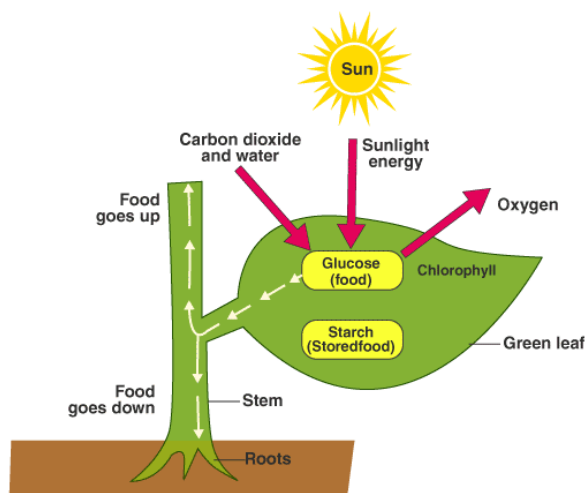
(a) Photosynthesis is a process in which green plants use sunlight to make their own food. Photosynthesis requires sunlight, chlorophyll, water, and carbon dioxide gas as raw materials to prepare food.

(b) The reaction involved in photosynthesis is



(c) The mechanism of photosynthesis is very simple. The photosynthesis takes place on the green leaves of the plant. The exchange of gases takes place through the stomatal pores present on the leaves. The water from the soil reaches the leaves by the tissue called Xylem. The root hairs on the root absorb water from the soil and through osmosis the water is transported to leaves through the tissue xylem. Xylem is the fundamental tissue for the transportation of water in plants. Chlorophyll is a pigment that can absorb solar energy in plants. It is present in the leaves of the plant. These are situated in the chloroplast of the plant cell. It is the vital photosynthetic pigment in leaves as it involves the conversion of light energy into chemical energy. The major steps involved in photosynthesis are as follows:

- Absorption of sunlight energy by chlorophyll.
- Light energy is converted into chemical energy and in this process the water molecule splits into its constituent atoms, hydrogen and oxygen.
- Carbon dioxide is reduced into its constituent sugars using the chemical energy.



64. (a) Name the raw materials required for photosynthesis. How do plants obtain these raw materials?

(b) What are the various conditions necessary for photosynthesis?

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

Answer

(a) The raw materials needed for photosynthesis are carbon dioxide and water. The carbon dioxide to plants is obtained by the leaves. The stomatal pores present on the leaves helps in the exchange of gases. The water from the soil reaches the leaves by the tissue called Xylem. The root hairs on the root absorb water from the soil and through osmosis the water is transported to leaves through the tissue xylem. Xylem is the fundamental tissue for the transportation of water in plants. Chlorophyll is a pigment that can absorb solar energy in plants.

(b) The various conditions necessary for photosynthesis are sunlight, chlorophyll, carbon dioxide and water. The photosynthesis takes place on the green leaves of the plant. The exchange of gases takes place through the stomatal pores present on the leaves. The water from the soil reaches the leaves by the tissue called Xylem. Chlorophyll is a pigment that can absorb solar energy in plants. It is present in the leaves of the plant. This involves the conversion of light energy into chemical energy.

(c) The factors that affect photosynthesis are:

- **Light:** Only in the presence of sunlight the process of photosynthesis occurs. This process mainly occurs during the day time.
- **Carbon dioxide:** It is the raw material for photosynthesis. Carbon dioxide breaks into its respective sugar components using the chemical energy and the food is stored in the form of energy.
- **Water:** The water from the soil reaches the leaves by the tissue called Xylem. The root hairs on the root absorb water from the soil and through osmosis the water is transported to leaves through the tissue xylem. The excess of water in the plants is lost through transpiration.

- Temperature: The rate of photosynthesis is less when the temperature is low. The rate of photosynthesis is proportional to temperature. Higher the temperature, the higher is the rate of photosynthesis.
- Minerals: The other minerals required by the plants are Nitrogen, phosphorous and potassium. These minerals play a major role in the growth and providing nutrients to plants.

65. (a) Define nutrition. Why is nutrition necessary for an organism?

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

(c) Name the mode of nutrition in (i) roundworm, and (ii) Plasmodium.

Answer

(a) The process of intake of nutrients like carbohydrates, fats, minerals, vitamins and proteins by an organism and also utilization of these nutrients by the organism is called nutrition. Nutrition provides energy to the organism from the food they eat. Each of the above-mentioned nutrients plays a vital role in the functioning of the body. Carbohydrates provide energy to the body, fats provide essential oils to the body, vitamins and minerals play a major role in building the cells and tissues in the body.

(b) The two different modes of nutrition are Autotrophic nutrition and heterotrophic nutrition.

Autotrophic nutrition: The mode of nutrition in which the organisms prepare their own food from the available inorganic materials like carbon dioxide, water, sunlight and chlorophyll from their surroundings is called autotrophic nutrition.

Example: Green plants

The mode of nutrition in which the organisms cannot prepare their own food from the available inorganic materials like carbon dioxide, water, sunlight and chlorophyll from their surroundings is called heterotrophic nutrition.

Example: Animals

(c) The mode of nutrition in roundworm and plasmodium is a parasitic mode of nutrition. These are the organisms which feed on other living organisms called host for their nutrition.

66. (a) What are herbivores, carnivores and omnivores? Give two examples of each.

(b) Classify the following into herbivores, carnivores and omnivores:

Lion, Man, Dog, Goat, Crow, Elephant, Snake, Hawk, Rabbit, Deer

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

Answer

(a) Herbivores: The animals which feed on plants, leaves, fruits and other natural products for their food are called herbivores. Example: cow, goat, sheep, etc.

Carnivores: The animals which feed on other animals for their food are called carnivores. Example: Lion, Cat, Shark, etc.

Omnivores: The animals which feed on both plants and animals for their food are called omnivores.

Example: Rats, Pigs, Bear etc.

(b) Herbivores: Goat, Elephant, Rabbit, Deer

Carnivores: Lion, Snake, Hawk

Omnivore: Man, Dog, Crow

(c) The five steps which occur in the process of nutrition in animals are Ingestion, digestion, absorption,

assimilation, and egestion.

Ingestion is the process the food is taken inside through mouth and broken down by teeth and initial digestion takes place in the mouth by saliva.

Digestion is the process in which food is digested by using few enzymes and is used by the cells for producing energy.

Absorption is the process in which cells use the energy from the digested food and helps in building tissues in our body.

Assimilation is the process in which digested food moves into the cells of the body.

Egestion is the process in which undigested food is removed out from the body through excretion.

67. (a) Describe the process of nutrition in amoeba. Draw labeled diagrams to show the various steps in the nutrition in amoeba.

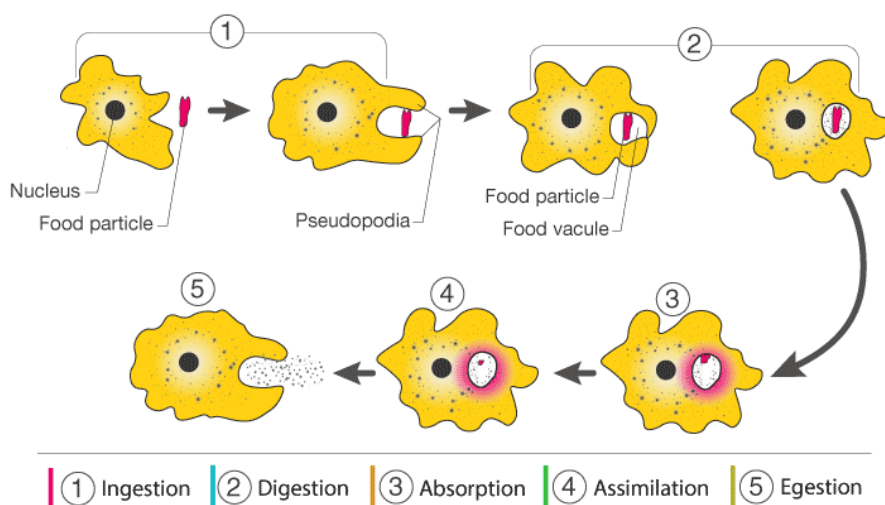
(b) What is the mode of nutrition in amoeba known as?

(c) What is the process of obtaining food by amoeba called? What does it mean?

Answer

(a) The process of nutrition in amoeba is as follows:

- Ingestion: The process the food is taken inside through mouth and broken down by teeth and initial digestion takes place in the mouth by saliva.
- Digestion: The process in which food is digested by using few enzymes and are used by the cells for producing energy.
- Absorption: The process in which cells use the energy from the digested food and helps in building tissues in our body.
- Assimilation: The process in which digested food moves into the cells of the body.
- Egestion: The process in which undigested food is removed out from the body through excretion.



(b) The mode of nutrition in amoeba is known as holozoic. In this mode of nutrition in the digestion of

food is allowed only after the ingestion of food.

(c) The process of obtaining food by amoeba is called Phagocytosis. Phagocytosis is the process by which a cell engulfs a particle and digests it.

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

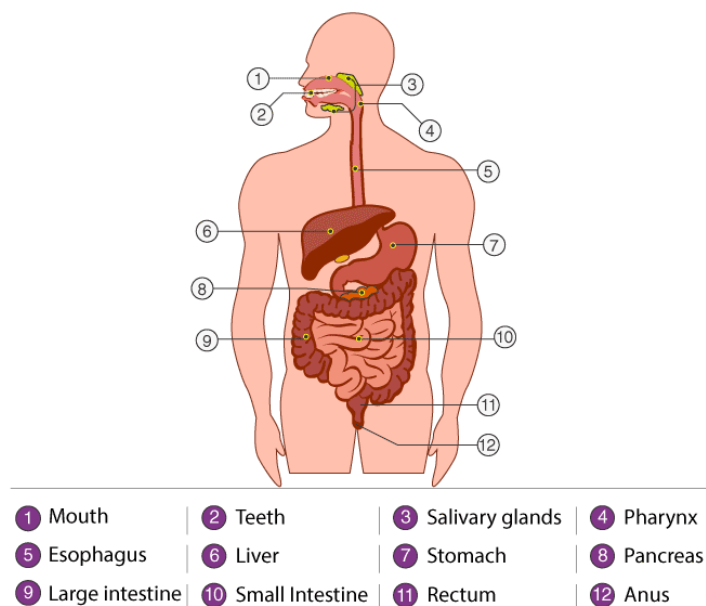
(b) Describe one way in which the small intestine is adapted for the absorption of digested food.

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

Answer

(a) The process of digestion in human beings is a complex process. The nutrition in humans is processed through the human digestive system. The digestive system consists of an alimentary canal and glands associated with it. The organs involved in the alimentary canal are mouth, esophagus, stomach, small intestine and large intestine. The glands associated with it are salivary glands, liver and pancreas. The alimentary canal is 9 meters long starting from the mouth and ends at the anus. The main five steps of human nutrition are:

- Ingestion: The process the food is taken inside through mouth and broken down by teeth and initial digestion takes place in the mouth by saliva.
- Digestion: The process in which food is digested by using few enzymes and are used by the cells for producing energy.
- Absorption: The process in which cells use the energy from the digested food and helps in building tissues in our body.
- Assimilation: The process in which digested food moves into the cells of the body.
- Egestion: The process in which undigested food is removed out from the body through excretion.



Digestion begins when food enters the mouth (oral cavity). Both mechanical and chemical digestion occurs in the mouth. Teeth grind and break up food. This is called the physical or mechanical digestion. An enzyme in saliva called amylase begins to break down into maltose sugar. This is called chemical digestion. After it is swallowed, the chewed food moves down the esophagus. The esophagus acts as a connection between the mouth and the stomach. The bolus (the chewed food coming from mouth) then reaches the stomach, where mechanical and chemical digestion take place further. The muscles in the stomach walls churn the bolus allowing it to mix with digestive enzymes and gastric acids like HCl. This process converts the bolus into a liquid called chyme.

The digestion in the stomach continues for several hours. During this process, an enzyme called pepsin breaks down most of the protein in the food. The chyme is slowly transported into the small intestine, where most chemical digestion takes place. Bile, which is made in the liver, is released from the gallbladder to help digest fats. In addition, enzymes from the pancreas and intestinal walls combine with the chyme to start the final part of digestion. Most of the nutrient absorption occurs in the small intestine. Nutrients are absorbed through its walls into the circulatory system and by the time the chyme exits the small intestine, only water and indigestible substances are left behind. The chyme then enters the large intestine. Here, water is removed and bacteria break down some indigestible materials, producing important compounds (such as vitamin K). The concentrated waste material that remains is called feces, which is passed into the rectum and eliminated from the body through the anus.

(b) Absorption of digested foods occurs mainly in the small intestine due to the presence of a large number of finger-like projections called villi. These projections absorb the protein molecules and help in the transfer of the proteins to all cells and tissues.

(c) The contraction and relaxation of muscles of the esophagus, intestine and stomach are called peristaltic movement. Peristaltic movement moves the food in the alimentary canal. The movement is involuntary and is mandatory for the movement of food from mouth and bowels through anus.

69.(a) Describe the parts of our tooth with the help of a labeled diagram.

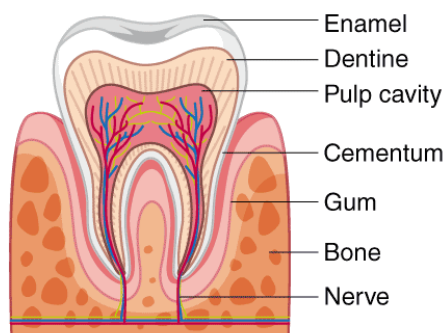
(b) What is meant by dental caries? How are they caused?

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

Answer

(a) Teeth are the strongest part of the human body. It consists of protein collagen and calcium as a mineral. Teeth form the first step in the process of digestion. Humans have different types of teeth that perform various functions such as cutting, tearing, shearing, grinding and crushing. The teeth are powered by the jaw muscles and lubrication is done with the help of saliva, which is produced in the salivary glands. Each tooth has four major parts. They are:

- Enamel: The outer layer of the tooth and the hardest material in the body.
- Dentin: The inner layer and the main part of the tooth, and the largest dental tissue.
- Pulp: Soft tissue on the inside of the tooth that contains the nerve, blood supply, and the ability to produce dentin.
- Root: The part of the tooth that secures it into the jaw.



(b) The formation of small cavities on teeth due to the action of acid-forming bacteria and improper dental care is called dental caries. Dental caries or tooth decay causes gradual softening of enamel and dentine. It begins when bacteria acting on sugars produce acids that soften or demineralize the enamel. Washing the mouth or brushing the teeth after eating removes the bacteria that produce acids. If untreated, microorganisms may invade the pulp, causing inflammation and infection.

(c) Dental plaque is a sticky, colorless or pale yellow film that is formed on teeth. When saliva, food and fluids combine, plaque is formed. It forms between the teeth and along the gum line. Dental plaque causes tooth decay. Plaque can also contribute to bad breath. The formation of plaque can be prevented by brushing the teeth at least twice a day. Floss between teeth at least once a day to remove food particles and bacteria. Using an antibacterial mouth rinse to reduce bacteria that cause plaque and gum disease.

70. (a) Name the main organs of the human digestive system. Also name the associated glands.

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

Answer

(a) The digestive system consists of an alimentary canal and glands associated with it. The organs involved in the alimentary canal are mouth, esophagus, stomach, small intestine and large intestine. The glands associated with it are salivary glands, liver and pancreas.

(b) Carbohydrates - The digestion of carbohydrates begins in the mouth. Salivary amylase enzyme present in saliva which the starch into maltose sugar. The intestinal juice of the small intestine completes the digestion of carbohydrates and finally converts it into glucose.

Fats - The process of digestion of fats begins in the stomach. The enzyme, lipase breaks down the fats present in the food. From the stomach the partially digested food goes into the small intestine where the pancreatic lipase breaks down the emulsified fats. The walls of small intestine secrete intestinal juice which converts the fats into fatty acids and glycerol.

Proteins - The digestion of proteins begins in the stomach. The enzyme, pepsin 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

71. Which of the following has the longest small intestine?

(a) Carnivore (b) Omnivore (c) Herbivore (d) Autotroph

Answer

(c) Herbivore has the longest small intestine. It's because they consume only plants and contains cellulose. Hence they need a longer small intestine to digest cellulose.

72. The process of obtaining food by amoeba is known as

(a) Dialysis (b) Cytokinesis (c) Phagocytosis (d) Amoebiasis

Answer

(c) Phagocytosis

Phagocytosis is a process by which certain living cells called phagocytes ingest or engulf other cells or particles. These may be either unicellular organisms like amoeba or our white blood cell.

73. The organism having a parasitic mode of nutrition is

(a) Penicillium (b) Plasmodium (c) Paramecium (d) Parrot

Answer

(b) Plasmodium

The mode of nutrition in which organisms feed themselves by depending on the host or on other living organisms. Plasmodium feed on other living organisms for food.

74. One of the following has a saprophytic mode of nutrition. The organism is

(a) Mushroom (b) Malarial parasite (c) Leech (d) Lice

Answer

(a) Mushroom

The mode of nutrition in which organisms feed on dead and decaying matter. Mushroom depends on dead and decaying plants for food.

75. The length of small intestine in human adult is

(a) 4.5m (b) 1.5m (c) 3.5m (d) 6.5m

Answer

(d) 6.5m

The small intestine is so long because it needs a maximum amount of surface area to increase digestion and nutrient absorption.

76. The process of digestion in human beings begins in

(a) Stomach (b) food pipe (c) mouth (d) small intestine

Answer

(c) Mouth

Digestion begins when food enters the mouth (oral cavity). Both mechanical and chemical digestion occurs in the mouth. Teeth grind and break up food. This is called the physical or mechanical digestion.

77. The process of digestion in human beings is completed in

(a) Oesophagus (b) small intestine (c) stomach (d) large intestine

Answer

(d) Large intestine

In the large intestine, water is removed and bacteria break down some indigestible materials, producing important compounds (such as vitamin K). The concentrated waste material that remains is called feces, which is passed into the rectum and eliminated from the body through the anus.

78. In the human digestive system, bile is secreted by

(a) Pancreas (b) Liver (c) Kidneys (d) Stomach

Answer

(b) Liver

Bile, which is made in the liver, is released from the gallbladder to help digest fats.

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

(a) Paramecium and Plasmodium (b) Plasmodium and Parakeet

(c) Parakeet and Paramecium (d) Paramecium and Parasite

Answer

(c) Parakeet and Paramecium

The mode of nutrition in which the digestion of food is allowed only after the ingestion of food is called the holozoic mode of nutrition. Human beings are also the example of holozoic mode of nutrition.

80. The autotrophic mode of nutrition requires

(a) Carbon dioxide and water (b) Chlorophyll (c) Sunlight (d) All the above

Answer

(d) All the above

The mode of nutrition in which organisms make their own food by the process of photosynthesis. The process by which plants make their own food using raw materials like sunlight, chlorophyll, water and carbon dioxide is called photosynthesis.

81. The correct order of steps occurring in nutrition in animals is

(a) Ingestion	Absorption	Digestion	Assimilation	Egestion
(b) Ingestion	Digestion	Assimilation	Absorption	Egestion
(c) Ingestion	Digestion	Absorption	Assimilation	Egestion
(d) Ingestion	Assimilation	Digestion	Absorption	Egestion

Answer

(c) Ingestion Digestion Absorption Assimilation Egestion

- Ingestion: The process the food is taken inside through mouth and broken down by teeth and initial digestion takes place in the mouth by saliva.
- Digestion: The process in which food is digested by using few enzymes and are used by the cells for producing energy.
- Absorption: The process in which cells use the energy from the digested food and helps in building tissues in our body.
- Assimilation: The process in which digested food moves into the cells of the body.
- Egestion: The process in which undigested food is removed out from the body through excretion.

82. In the 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

- (d) Stomach and pancreas**

Pepsin is an enzyme that breaks down proteins into smaller amino acids. In the small intestine, trypsin breaks down proteins, continuing the process of digestion that began in the stomach.

83. When carrying the starch test on a leaf, why is it important to boil the leaf in an 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 the chemical reaction in the cell**

Answer

- (c) To remove the chlorophyll**

On boiling the leaf in alcohol, the leaf becomes decolorized, and when it is treated with iodine, the blue-black color clearly indicates the presence of starch. To avoid the interference of green color, it is treated with alcohol.

84. 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

- (d) Proteins, fats and carbohydrates**

Trypsin- helps to digest proteins.

Amylase - helps to digest sugars (carbohydrates).

Lipase - helps to digest fat.

85. Which of the following is correct regarding bile?

- (a) Secreted by bile duct and stored in the liver
(b) Secreted by the gall bladder and stored in the liver
(c) Secreted by the liver and stored in the bile duct
(d) Secreted by the liver and stored in the gall bladder**

Answer

(d) Secreted by the liver and stored in the gall bladder

Bile is a fluid that is made by the liver, stored in the gallbladder and passes through the common bile duct where it helps in the digestion of fat.

86. Where are proteins digested in the alimentary canal?

(a) Small intestine (b) Esophagus (c) mouth (d) stomach

Answer

(d) Stomach

Chemical digestion of protein begins in the stomach and ends in the small intestine. The body recycles amino acids to make more proteins.

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

(a) Pepsin (b) Mucus (c) Saliva (d) Bile

Answer (b) Mucus

The mucus in gastric juice helps protect the stomach wall from the corrosive effect of hydrochloric acid.

88. Which part of the alimentary canal receives bile from the liver?

(a) Esophagus (b) small intestine (c) Stomach (d) Large intestine

Answer

(b) Small intestine

The small intestine receives the bile from the liver which helps in the breakdown of fats. Bile juice is produced in the liver and stored in gall bladder.

89. 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) Fats (c) Minerals (d) Carbohydrates

Answer

(d) Carbohydrates

Carbohydrates that starch and is digested by salivary amylase present in saliva are converted into maltose and it also gets digested by pancreatic juices in the pancreas.

90. 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 to ulcers

Answer

(b) Starch breaking down into sugars

In case, saliva is lacking, it will affect the breakdown of starch. The protein digestion begins in the stomach by the enzyme pepsin and completes in the small intestine by enzyme trypsin.

91. Which of the following are 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

Pancreatic juice contains trypsin acts on proteins. Fats are not soluble in water and hence lipids act on fats.

92. The oxygen liberated from plants during photosynthesis comes from

(a) Glucose (b) Water (c) Carbon dioxide (d) Chlorophyll

Answer

(b) Water

The oxygen during photosynthesis comes from split water molecules. During photosynthesis, the plant absorbs water and carbon dioxide. After the absorption, the water molecules are disassembled and converted into sugar and oxygen.

93. Which of the following is an incorrect statement?

(a) Energy is essential for the life process

(b) Organisms grow with time

(c) Movement of molecules does not take place among cells

(d) Organisms must repair their body and maintain time

Answer

(c) Movement of molecules does not take place among cells

Water, carbon dioxide, and oxygen are among the few simple molecules that can cross the cell membrane by diffusion. Hence, the Movement of molecules takes place in a cell.

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

(a) Proteins (b) Fatty acids (c) Glycogen (d) Starch

Answer

(d) Starch

Autotrophs comprise of green plants that photosynthesize their own food and store it in the form of starch.

95. Which of the following events does not occur in photosynthesis?

(a) Conversion of light energy to chemical energy

(b) Reduction of carbon dioxide into carbohydrates

(c) Oxidation of carbon to carbon dioxide

(d) Absorption of light energy by chlorophyll

Answer

(c) Oxidation of carbon to carbon dioxide

Carbon dioxide is reduced and fixed in the form of carbohydrates. While oxygen is released from the water molecules.

96. The opening and closing of stomatal pores depends on

(a) Oxygen (b) Water in guard cells (c) Temperature (d) Concentration of CO₂ in guard cells

Answer

(b) Water

The guard cells swell when water flows into them, causing the stomatal pores to open. Similarly the pore closes if the guard cells shrink or lose water in them.

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

(a) Proteins (b) Nitrites and nitrates (c) urea (d) Atmospheric nitrogen

Answer

(b) Nitrites and nitrates

Nitrate is the form of nitrogen most used by plants for growth and development. Some bacteria in the soil can turn ammonia into nitrites.

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

(a) Pepsin (b) Cellulose (c) Amylase (d) Trypsin

Answer

(c) Amylase

Salivary amylase, present in saliva, is the first digestive enzyme that gets mixed with food in the mouth. The salivary amylase hydrolyzes starch into maltose.

99. Which of the following is the correct statement?

(a) Heterotrophs synthesis their own food

(b) Heterotrophs utilize solar energy for solar energy

(c) Heterotrophs do not synthesis their own food

(d) Heterotrophs are capable of converting carbon dioxide and water into carbohydrates

Answer

(c) Heterotrophs do not synthesis their own food

Heterotrophs are organisms that cannot prepare their own food and depend on other organisms for their nutrition.

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

(a) Mushroom, Green plants, Amoeba

(b) Yeast, Mushroom, Bread mold

(c) Paramecium, Amoeba, Cuscuta

(d) Cuscuta, Lice, Tapeworm

Answer

(b) Yeast, Mushroom, Bread mold

These organisms have a saprophytic mode of nutrition. They break down complex organic substances by secreting digestive enzymes outside their body and absorb simple molecules as nutrients.

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

(a) Mouth Stomach Small intestine Esophagus Large intestine

(b) Mouth Esophagus Stomach Large intestine Small intestine

(c) Mouth Stomach Esophagus Small intestine Large intestine

(d) Mouth Esophagus Stomach Small intestine Large intestine

Answer

(d) Mouth Esophagus Stomach Small intestine Large intestine

The food is entered through the mouth and then it reaches the stomach through food pipe where the food is digested. Then it moves to the small intestine where most of the nutrients are absorbed and reaches the large intestine. The large intestine absorbs all the water contents and the undigested food is moved to the rectum.

Questions based on High Order Thinking Skills (HOTS)

102. 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 act on the part F in the lower part of the tooth which contains nerves and blood cells. 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 (ii) part D, of the tooth known as?
- (c) By what name are the holes E in the tooth known as?
- (d) Name the part F of the tooth?
- (e) What will happen if organisms A reach F part of tooth?

Answer

- (a) (i) Bacteria (ii) Acid
- (b) (i) Enamel (ii) Dentine
- (c) Dental caries
- (d) Pulp cavity
- (e) Infection and inflammation will occur which will lead to severe pain.

103. If 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 neutralize 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 the dental plaque.
- (b) (i) X refers to the saliva, while (ii) Y refers to the salivary glands.
- (c) Organisms Z are bacteria.
- (d) Layer of W, dental plaque, can be removed by regular brushing of teeth.

104. 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 the tongue. 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 pushes the food into the 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 the stomach from the damaging effect of substance F whereas substance H is an enzyme for digestion. The partially digested food then enters into the 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) Gland A is a salivary gland.
 - (ii) Substance B is saliva.
 - (iii) Enzyme C is salivary amylase.
- (b) Tube D is oesophagus.
- (c) The movement E is known as peristaltic movement.
- (d) (i) F is hydrochloric acid, (ii) G is mucus and (iii) H is pepsin

105. 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 secretion of two glands: liver and pancreas. The 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 the bloodstream. 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 through opening J as feces in the process known as K.

- (a) Name the organ A.
- (b) Name (i) liquid B, and (ii) 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) The organ A is small intestine.
- (b) (i) Liquid B is bile and (ii) organ C is gall bladder.
- (c) The digestive enzymes D, E, and F are amylase, trypsin, and lipase, respectively.
- (d) The projections G are villi that are present on the inner wall of organ A.
- (e) (i) Tube H is the large intestine, (ii) part I is the rectum, (iii) opening J is the anus and (iv) the process K is egestion or defecation.

106. 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 the 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) chemical S, and (ii) process T.
(d) Name (i) organelle U, and (ii) process V.

Answer

- (a) The unicellular animal P is Amoeba.
(b) (i) Q is pseudopodia and (ii) R is the food vacuole.
(c) (i) Chemical S is the digestive enzyme and (ii) process T is diffusion.
(d) (i) Organelle U is cell membrane and (ii) process V is egestion.

107. 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 utilizing 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 the organisms which could be like (i) A (ii) B (iii) C, and (iv) D

Answer

- (a) (i) Organism B refers to an omnivore, (ii) organism D refers to a herbivore and (iii) organism A refers to a carnivore.
(b) Organism C is an autotroph.
(c) The organisms A, B, and D are heterotrophs as they obtain food from other organisms and cannot synthesize their own food.
(d) Organism C can be a producer as it is an autotroph.
(e) The organisms A, B and D are consumers as they all are heterotrophs.
(f) The examples of organisms A, B, C and D are lion, crow, green plants (like mango) and cow, respectively.

108. 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 (iii) C.

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

Answer

(a) (i) A - parasitic mode of nutrition, (ii) B - holozoic mode of nutrition (iii) C - saprophytic mode of nutrition.

(b) The organisms like D are called hosts.

(c) The process E is egestion.

(d) The example of organisms like (i) A-Tapeworm, (ii) B – Amoeba (iii) C- Fungi

(e) The general name of the three modes of nutrition exhibited by organisms A, B and C are parasitic nutrition, holozoic nutrition and saprophytic nutrition, respectively.

109. 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-colored 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. Food H gives a blue-black color with a 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 colored substance E, and (ii) organ F.

(d) What is the process G?

Answer

(a) (i) A is a green plant, (ii) B is glucose (iii) H is starch.

(b) C is carbon dioxide and D is water.

(c) (i) The green-colored substance E is chlorophyll and (ii) F is a leaf.

(d) The process G is photosynthesis.

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

(a) What are animals like X known as?

(b) What are animals 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) Animals like X are known as carnivores.

(b) Animals like Y are known as herbivores.

(c) Animals like X have longer small intestine as they eat grass and they need long intestine to digest

the cellulose present in the grass.

(d) Carnivore example: Bear.

(e) Herbivore example: Rabbit.

Pages 40-51

Very short answer

1. Do all cells use oxygen to produce energy?

Answer

No, all cells do not use oxygen to produce energy. Cells can also produce energy by anaerobic respiration. It is a process which takes place in the absence of oxygen gas. In this process, the energy is obtained by the breakdown of glucose in the absence of oxygen.

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

Answer

Ethanol is produced as the result of the breakdown of pyruvate during anaerobic respiration, not in aerobic respiration. Fermentation is a form of anaerobic respiration in which alcohol is formed by the breakdown of glucose in the absence of oxygen. It is usually done by the yeast. In alcoholic fermentation, pyruvic acid is converted into ethanol with the liberation of carbon dioxide.

3. Name one organism which can live without oxygen.

Answer

Yeast can live without oxygen. An anaerobic organism or anaerobe is any organism that does not require oxygen for growth.

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

Answer

In aerobic respiration, more energy is released because there is a complete breakdown of food. In this process glucose breaks down in the presence of a sufficient amount of oxygen and hence more energy is released.

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

Answer

Lactic acid, which is formed in muscles during vigorous physical exercise, may cause cramps. When a person runs fast, lactic acid builds up in the muscles, causing painful cramps. The extra oxygen taken while breathing reacts with the lactic acid in the muscles, breaking it down to make carbon dioxide and water. As the lactic acid breaks down the cramps will begin to disappear.

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

Answer

Root hair is involved in the exchange of respiratory gases as they are in direct contact with the air present in the soil. These contain pore in the outer layer of the roots that helps in exchanging the gases.

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

Answer

All the plant parts like roots, stems and leaves get oxygen by passive diffusion, which is required for respiration. Diffusion occurs in plant cells. Carbon dioxide diffuses from the air through tiny pores in plant leaves called stomata. Oxygen produced by photosynthesis diffuses from the plant through the stomata into the atmosphere.

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

Answer

Stomata are the pores present on the surface of the leaves through which exchange of gases takes place. Stomata also helps in the transpiration, in which the loss of water from the surface of leaves in the form of water vapor.

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

Answer

The outer covering of the woody stems, which is known as the bark, has lenticels through which respiratory exchange of gases takes place. Lenticels are raised surface on the bark made up of porous tissues composed of cells with large intercellular spaces.

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

Answer

Root hair is the extension of the epidermal cells of a root, which help in respiration. Root hairs act like a sponge underground. They absorb nutrients and water which are sent through the tip of the plant's root.

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

(a) all the time?

(b) Only during daytime?

Answer

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

(b) Photosynthesis occurs only at daytime as it can take place only in the presence of sunlight.

12. Name the organs of breathing in fish.

Answer

In fish, gills are the organs of breathing. Aquatic animals may breathe air or extract oxygen that dissolved in water through specialized organs called gills, or directly through the skin.

13. Name an animal which absorbs oxygen through its moist skin.

Answer

Frog absorb oxygen through their moist skin. These come under the class of amphibians. Almost all amphibians have thin, moist skin that helps them breathe.

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

Answer

Spongilla depends on simple diffusion of gases for breathing.

15. Name two animals which breathe through gills.

Answer

Aquatic animals like sharks and tadpoles breathe through gills. Aquatic animals may breathe air or extract oxygen that dissolved in water through specialized organs called gills, or directly through the skin.

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

Answer

The trachea divides into two tubes at its lower end, which are known as bronchi. These are the airways that lead from the trachea into the lungs, and then branch into smaller bronchioles.

17. Where does the blood absorb oxygen in the human body?

Answer

Blood absorbs the oxygen in the small organelles also known as Alveoli (singular name is Alveolus). These are present in the lungs.

18. Name the red pigment which carries oxygen in blood.

Answer

Hemoglobin is the red pigment that is present in red blood cells. The main purpose of hemoglobin is to transport oxygen to all parts of the body from lungs.

19. Which gases are exchanged in your lungs?

Answer

Carbon dioxide and oxygen are exchanged in the lungs. Lungs purifies the inhaled air and transport to all parts of body. The impure air containing carbon dioxide is exhaled.

20. Where in the lungs does gas exchange take place?

Answer

Gas exchange takes place in the alveoli of the lungs. These are tiny, balloon-shaped air sacs sit at the very end of the respiratory tract and are arranged in clusters throughout the lungs.

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

Answer

Alveoli are the tiny air sacs at the end of smallest bronchioles in the lungs. These are tiny, balloon-shaped air sacs sit at the very end of the respiratory tract and are arranged in clusters throughout the lungs. Gas exchange takes place in the alveoli of the lungs.

22. What is the other name of the wind-pipe?

Answer

Wind-pipe is also known as a trachea. The trachea, is a cartilaginous tube that connects the larynx to the bronchi of the lungs which allows the passage of air.

23. What organs are attached to the two bronchi?

Answer

The two lungs are attached to the two bronchi. The lungs are a pair of spongy, air-filled organs located on either side of the chest. These are the vital organs of the respiratory system.

24. In the lungs:

(a) What substance is taken into the body?

(b) What substance is removed from the body?

Answer

(a) Oxygen is taken into the body. The oxygen is transported to all parts of the body through blood.

(b) Carbon dioxide is removed from the body. The impure blood containing carbon dioxide is brought back to the lungs and then exhaled.

25. State whether the following statements are true or false:

(a) During respiration, the plants take CO_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

During respiration, the plants take oxygen and release carbon dioxide. The exchange of gases take place the stomatal pores present on leaves of the plant.

(b) True

Energy can be produced in the cells even without oxygen. Anaerobic respiration also produces energy and uses glucose, but it produces less energy and does not require oxygen.

(c) False

Fish breathe through the organ called gills and earthworms breathe through their moist skin.

26. 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) The organs of respiration in man are the lungs.

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

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

(d) Yeast undergoes anaerobic respiration, whereas Amoeba undergoes aerobic respiration.

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

Short Answer Type Questions

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

Answer

The roots of plant cannot respire if they remain waterlogged for a long time. The water molecules block the stomatal pores present on the leaves and makes the plant difficult to respire, which leads to death of the plant.

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

Answer

Aerobic respiration	Anaerobic respiration
<ul style="list-style-type: none"> The respiration occurs in the presence of oxygen. 	<ul style="list-style-type: none"> The respiration occurs in the absence of oxygen.

<ul style="list-style-type: none"> Food is completely broken down into carbohydrates and sugar. 	<ul style="list-style-type: none"> The food is not broken down completely.
<ul style="list-style-type: none"> Carbon dioxide and water are the products. 	<ul style="list-style-type: none"> Ethanol and carbon dioxide or lactic acid in animal muscles are the anaerobic respiration.
<ul style="list-style-type: none"> Large amount of energy is liberated. 	<ul style="list-style-type: none"> Less amount of energy is liberated.

The organisms that use anaerobic mode of respiration include some bacteria and microorganisms such as yeast.

29. 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) Ethanol, carbon dioxide and energy are the final products during anaerobic respiration in plants (like yeast).

(b) Lactic acid and energy are the final products during anaerobic respiration in an animal tissue (like muscles).

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

Answer

Anaerobic respiration takes place in human muscles during vigorous physical exercise. During exercise our body needs more energy and aerobic respiration is not sufficient. Hence muscles start anaerobic respiration to meet the energy needs.

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

(a) C_2H_5OH and CO_2

(b) CO_2 and H_2O

(c) Lactic acid

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

Answer

(a) The end products are C_2H_5OH and CO_2 , hence it is anaerobic respiration. Example: Yeast

(b) The end products are CO_2 and H_2O , hence it is the aerobic respiration. Example: Humans

(c) The end product is lactic acid, hence it is the anaerobic respiration. Example: Muscles in human beings

32. Define breathing. State the differences between breathing and respiration.

Answer

The physical mechanism in which an organism takes up oxygen from the air and gives out carbon dioxide is called breathing.

Breathing	Respiration
It is a physical mechanism.	It is a biochemical mechanism.
Only the exchange of gases takes place.	The exchange of gases and oxidation of food take place simultaneously.
Lungs are the only organ involved in the process.	Lungs as well as mitochondria present in the cell are also involved.

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

Answer

The different ways in which glucose is oxidized to provide energy in various organisms are aerobic and anaerobic respiration.

Aerobic respiration: The respiration which take place in the presence of oxygen is called aerobic respiration. Example Plants

Anaerobic respiration: The respiration which take place in the absence of oxygen is called aerobic respiration. Example Bacteria

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

Answer

The lungs always contain a residual volume of air so that there is a sufficient amount of oxygen present for oxygen to be absorbed into the blood and carbon dioxide to be released from the blood. The residual volume also functions to keep the alveoli open even after maximum respiration.

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

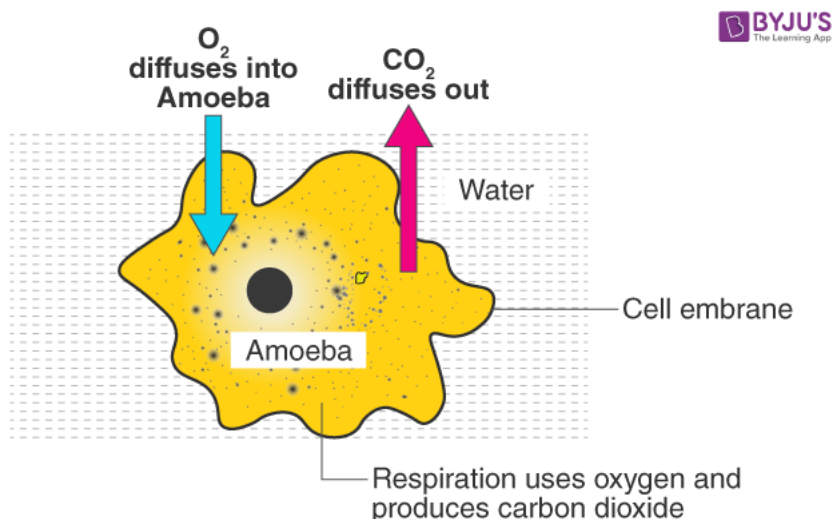
Answer

Inhalation of carbon monoxide is dangerous because Carbon monoxide combines with hemoglobin and forms carboxyhemoglobin. This carboxyhemoglobin replaces oxygen. Then blood faces the shortage of oxygen. Due to the lack of oxygen, the person will face difficulty in breathing. The person may also die due to this lack of oxygen. So it is dangerous to inhale air containing carbon monoxide.

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

Answer

Amoeba depends on diffusion of gases for breathing. The diffusion of gases takes place through the thin cell membrane of amoeba. Amoeba lives in water. The dissolved oxygen from water diffuses into the body of amoeba through its cell membrane. The oxygen spreads quickly into the whole body and is used for respiration inside the amoeba cell. The process of respiration produces carbon dioxide which diffuses out through its cell membrane into the surrounding water. Aerobic respiration takes place in amoeba.



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

Answer

The common features of the respiratory organs like skin, gills and lungs are:

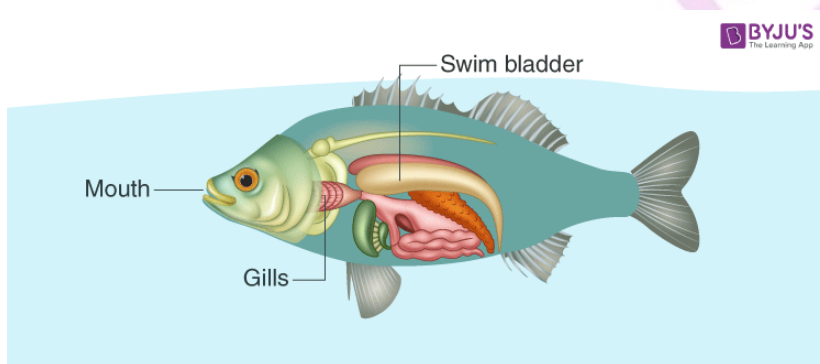
- Adequate surface area to transport oxygen in the organism

- The exchange of gases and diffusion is easy due to the thin walls of the respiratory organs
- Enough amount of blood for transporting the gases in the organism.

38. Describe the process of respiration in fish.

Answer

Aquatic animals like fish have specialised organ for breathing. The organ is gills. The exchange of gases takes place here. The oxygen dissolved in water is used by the fish for breathing. The fish, first takes the water in mouth and then sends it to gills. The gills extract the dissolved oxygen and the remaining water is transported out through the slits present in the gills. The blood transports the absorbed oxygen to all parts of the body. The blood also brings the carbon dioxide from the other body parts and is expelled through gills to the water present in the surrounding.

**39. What would be the consequences of deficiency of hemoglobin in our bodies?**

Answer

The deficiency of hemoglobin causes the following problems in the body:

- Anemia due to iron deficiency
- Tiredness
- Lack of oxygen supply to the body parts
- Difficulty in breathing

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

(a) Root

(b) Stem
(c) Leaves

Answer

(a) The root hair present on the root helps in respiration by diffusion. The oxygen present in between the soil particles is absorbed by these root hair by diffusion. The carbon dioxide produced in the cells move out through these root hair by the same process of diffusion.

(b) The stems of the herbaceous plants contain stomata. The pores present on the stem helps in the exchange of gases and carbon dioxide present in the air diffuses out through the same pores. Lenticels are present in the woody stems for the exchange of gases.

(c) The respiration in leaves takes place through the tiny pores called stomata present on them. The exchange of gases occurs through these pores. The oxygen is transported to other cells of the plant by diffusion and in the same carbon dioxide is removed from the cells. In this way respiration takes place in leaves.

41. (a) What is meant by aquatic animals and terrestrial animals?

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

Answer

(a) The animals which live in water and have a special organ for respiration are called aquatic animals. Example: Fish, Shark, Octopus etc.

The animals which live on land and respire through lungs are called terrestrial animals. Example: Cow, Goat, Tiger etc.

(b) The oxygen for aquatic animals is obtained from the oxygen dissolved in water. Water contains two hydrogen and one oxygen molecule. This dissolved oxygen is utilized by the aquatic animals for breathing.

The oxygen for terrestrial animals is obtained from the air present in the surrounding atmosphere. The atmosphere contains necessary oxygen for all the terrestrial plants and animals.

42. Why do fishes die when taken out of water?

Answer

Fishes die when taken out of water because the respiratory organ that is gills is specialized in such a way that, it can only extract dissolved oxygen from the water and provide it to fish. The gills are not specialised to take oxygen from the air in the surrounding atmosphere. Hence, due to lack of oxygen fishes die when taken out of water.

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

Answer

The rate of breathing in aquatic organisms much faster than in terrestrial organisms because aquatic animals breathe from the oxygen dissolved in water. The dissolved oxygen is less as compared to the amount of oxygen present in the atmosphere. Hence, the rate of breathing in aquatic organisms much faster than in terrestrial organisms.

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

Answer

The energy currency in living organisms is adenosine triphosphate (ATP). In aerobic respiration process it is produced in cytoplasm and in anaerobic respiration process it is produced in mitochondria of the cell.

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

Answer

Plants have low energy needs as compared to animals. It's because plants do not move from one place to another. Plants show only tropic movements and movements are at the cellular level. But, in case of animals it is entirely different. Animals move from one place to another in search of food, prey, water, shelter, etc. The energy requirement is more in animals. Hence plants have low energy needs as compared to animals.

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

Answer

It would definitely benefit deep-sea divers if humans also had gills. Then the divers would not have carried the oxygen cylinders along with them as they would breathe with the help of dissolved oxygen in water. The divers need have taken much efforts of carrying the cylinders.

47.(a) What is the function of the respiratory system?

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

(c) Draw a labeled diagram of the human respiratory system.

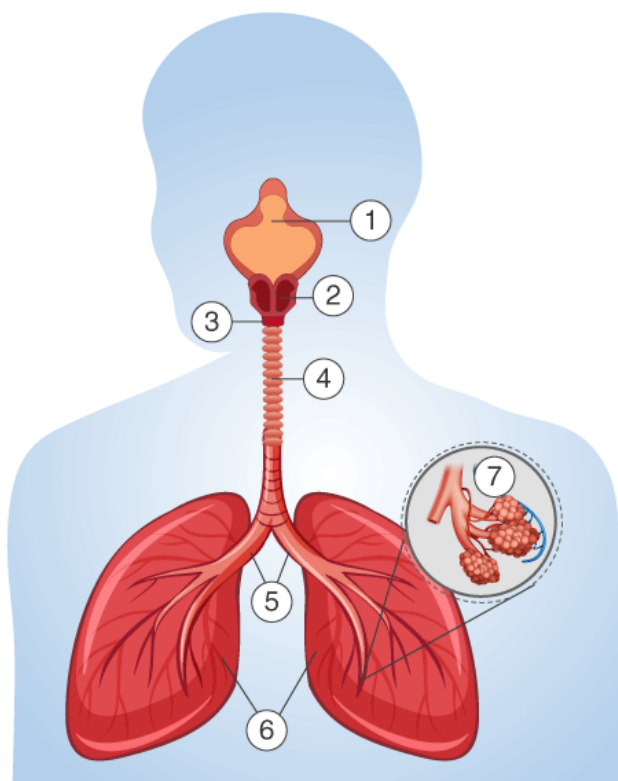
Answer

(a) The main function of the respiratory system is the exchange of gases from the body. The respiration system must help in removing the carbon dioxide from the body during exhalation and oxygen must be absorbed from the inhaled air. Respiratory system must also help in the breakdown of food and supply to all parts of the body.

(b) The major organs of respiratory system in a human being are:

- Nose
- Nasal passage
- Trachea
- Bronchi
- Lungs
- Alveoli
- Diaphragm

(c) Human Respiratory System:



- | | | | |
|----------------|-----------|-----------|-----------|
| 1 Nasal cavity | 2 Pharynx | 3 Larynx | 4 Trachea |
| 5 Bronchi | 6 Lungs | 7 Alveoli | |

48. (a) Explain how, the air we breathe in gets cleaned while passing through the nasal passage.
 (b) Why do the walls of trachea not collapse when there is less air in it?
 (c) How are oxygen and carbon dioxide exchanged in our body during respiration?
 (d) How are lungs designed in human beings to maximize the exchange of gases?

Answer

(a) The nasal passage plays a vital role in the purification of air. Nasal passage contains mucus and hair in it. The hair prevents the dust particles entering the respiratory tract and mucus also plays in preventing the fine particles of dust from entering into the track.

(b) The walls of the trachea do not collapse when there is less air in it because the trachea is supported by rings of soft bones called cartilage.

(c) The alveoli of lungs play a major role in the exchange of gases. The oxygenated air diffuses from the alveoli into the blood. When the blood is circulated in different parts of the body, the oxygen is

carried to all cells and tissues through this blood. This oxygen is combined with the digested food and releases energy in the cell. Carbon dioxide which is produced as a waste product during respiration is diffused into the blood. Blood brings back the carbon dioxide into alveoli and then it is exhaled through nostrils passing through trachea.

(d) The human lungs have been designed to maximize the exchange of gases. There are millions of alveoli in the lungs. The presence of millions of alveoli in the lungs provide a very large area for the exchange of gases. The availability of large surface area maximizes the exchange of gases.

49. (a) Give the main points of difference between respiration in plants and respiration in animals.

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

(c) Which contains more carbon dioxide: exhaled air or inhaled air? Why?

Answer

(a)

Respiration in plants	Respiration in animals
Respiration is done individually in all parts of the plant.	Respiration is done by a single system.
A small amount of gases is transported to all parts of the plant.	The gases are transported to all parts of the body covering long distances.
The respiration occurs at a slow rate.	The respiration occurs at a faster rate.

(b) (a) During day time the plants use the oxygen produced during the process of photosynthesis. Carbon dioxide produced during respiration is used for the process of photosynthesis. Some amount of carbon dioxide is also taken from the air. So during day time, oxygen diffuses out and carbon dioxide diffuses in.

(b) At night, as photosynthesis does not takes place, oxygen is not produced. Thus, oxygen from the air diffuses into the leaves to carry out respiration. And carbon dioxide produced by respiration diffuses out into the air. So, at night, oxygen diffuses in and carbon dioxide diffuses out.

(c) Exhaled air contains more carbon dioxide because we exhale to remove the waste product. During respiration oxygen breaks down glucose and hence more amount of carbon dioxide is released.

50. (a) "Respiration is a vital function of the body". Justify the statements.

(b) What is the main difference between aerobic respiration and anaerobic respiration? Give one

example of each.

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

Answer

(a) Respiration is a vital function of the body because it provides energy for carrying out all the life processes that are necessary to keep the organisms alive. Most living things need oxygen to obtain energy from food. This oxygen reacts with the food molecules present in the body cells and burns them slowly to release energy. This energy is stored as ATP molecules in the cells. The process of releasing energy from food is called respiration.

(b)

Aerobic Respiration	Anaerobic Respiration
It takes place in the presence of oxygen.	It takes place in the absence of oxygen.
A complete breakdown of food occurs in aerobic respiration.	A partial breakdown of food occurs in anaerobic respiration.
The end products are carbon dioxide and water.	The end products may be ethanol and carbon dioxide (as in yeast cells) or lactic acid (as in muscle cells).
It produces a considerable amount of energy.	Much less energy is produced in anaerobic respiration.

(c) (i) Anaerobic respiration takes place in yeast.

(ii) Aerobic respiration takes place in humans.

51. (a) Why is diffusion insufficient to meet the oxygen requirements of large multicellular organisms like humans?

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

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

Answer

(a) In multicellular organisms like humans the transport of oxygen by diffusion is more as compared to other unicellular organisms. Due to a large number of cells and the huge size of the body the oxygen cannot diffuse quickly into all cells of the body. In unicellular organisms, the size of the organism is small and the cell present is also singular. Hence, diffusion is insufficient to meet the oxygen requirements of large multicellular organisms like humans.

(b) In large animals, the blood circulatory system contains hemoglobin which carries blood to all parts of the body.

(c) A terrestrial animal has over an aquatic animal with regard to obtaining oxygen for respiration. It's because the air in the atmosphere contains the maximum amount of oxygen. Aquatic animals have only

dissolved oxygen in water which is in minimal amount. Hence, terrestrial animal has over an aquatic animal with regard to obtaining oxygen for respiration.

Multiple Choice Questions

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

- (a) C_2H_5OH
- (b) H_2O
- (c) CO_2
- (d) ATP

Answer

- (b) H_2O

Anaerobic respiration occurs in the absence of oxygen. Hence water molecule is not released.

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

- (a) Amoeba
- (b) Yak
- (c) Yeast
- (d) Leech

Answer

- (c) Yeast

Yeast can live without the oxygen present in the air as it undergoes anaerobic respiration.

54. During respiration, the exchange of gases takes place in:

- (a) bronchi
- (b) alveoli
- (c) bronchioles
- (d) trachea

Answer

- (b) alveoli

Alveoli are the pouch-like air sacs at the end of the small bronchioles, which send oxygen to all parts of the body through blood.

55. 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

- (a) Electric eel

Electric eel is the organism in which the gaseous exchange during respiration occurs through mouth.

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

	Carbon dioxide always produced	A lot of energy released
(a)	No	Yes
(b)	No	No
(c)	Yes	No
(d)	Yes	Yes

Answer

- (b) No No

There are two pathways through which anaerobic respiration occurs. In micro-organisms such as yeast, and in muscles during heavy physical exercise. Carbon dioxide is not released during process.

57. 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

- (c) lactic acid

This is because, here, anaerobic respiration takes place in which glucose is converted into lactic acid.

58. 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

- (b) The oxidation of food substances to release energy

Internal respiration may be defined as the oxidation of food substances to release energy.

59. 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 vapor

Answer

- (b) carbon dioxide

Lime water turns milky due to the presence of carbon dioxide in the exhaled air.

60. 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

- (d) Nostrils → pharynx → larynx → trachea → alveoli

The total sequence of air passage during inhalation is as follows:

Nostrils → Nasal chambers → Pharynx → Larynx → Trachea → Bronchi → Bronchioles → Alveoli

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

- (a) ethanol
- (b) carbon dioxide
- (c) acetic acid
- (d) lactic acid

Answer

- (d) lactic acid

Lack of oxygen in muscles causes accumulation of lactic acid, due to anaerobic respiration. Accumulation of lactic acid leads to cramps in the legs of sprinters.

62. 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

- (a) cytoplasm

Pyruvic acid is converted into lactic acid in cytoplasm in absence or deficiency of oxygen.

63. 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

- (c) (i) and (iv)

Fermentation takes place in the case of anaerobic bacteria and also in cytoplasm.

64. 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) Hemoglobin has a greater affinity for carbon dioxide than oxygen.**
 - (iv) Alveoli increase the surface area of the exchange of gases**
- (a) (i) and (iv)**
 - (b) (ii) and (iii)**
 - (c) (i) and (iii)**
 - (d) (ii) and (iv)**

Answer

(d) (ii) and (iv)

Alveoli are the tiny air sacs that help in the exchange of gases. These are connected to tiny blood capillaries. They also increase the surface area of gases in order to ease the process of the exchange of gases.

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

- (a) DTP
- (b) PDP
- (c) ATP
- (d) DDT

Answer

(c) ATP

ATP stores energy in the cell. Hence, it is known as currency of cells in biology.

66. 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

(c) leech and earthworm

Leech and earthworm breathe only through their moist skin. Other organisms given here breathe through lungs and skin.

67. 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

(b) prawn

Prawn is an aquatic animal that respire through gills. Insects breathe through tracheae.

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

- (a) water vapor
- (b) oxygen
- (c) carbon dioxide
- (d) all the above

Answer

- (c) carbon dioxide

During daytime, the carbon dioxide produced through respiration is used up in photosynthesis by leaves. So carbon dioxide is not released during day time.

69. 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

- (b) lenticels

In woody stems, the bark (outer covering of the stem) has lenticels for gaseous exchange.

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

- (a) Amoeba
- (b) Prawn
- (c) Planaria
- (d) Bryophyllum

Answer

- (b) Prawn

Prawn is an aquatic animal that respire through gills, other organisms depend on diffusion of gases for breathing.

71. 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

- (d) lactic acid

The anaerobic respiration by the muscles brings about a partial breakdown of glucose to form lactic acid.

72. In cockroaches, air enters the body through:

- (a) lungs
- (b) gills
- (c) spiracles
- (d) skin

Answer

- (c) spiracles

In insects, tiny pores are present on the body called spiracles. Air enters the body through these pores.

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

- (a) man
- (b) fish
- (c) dog
- (d) sparrow

Answer

- (b) Fish

Fish uses the dissolved oxygen in water, which is in a minimal quantity. Hence fish has higher breathing rate than other organisms.

Questions Based on High Order Thinking Skills

74. 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, as it undergoes anaerobic respiration. In this process, glucose breaks down to form alcohol and carbon dioxide.
(d) Plants
(e) Bacteria

75. A, B and C are three living organisms. The organism A is a unicellular fungus that 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 that acts as a carrier of malarial parasite. It breathes and respire through a kind of tiny holes R and air-tubes S in 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) (i) A - yeast. (ii) B - Amoeba. (iii) C - mosquito.
(b) (i) P is alcohol.
(ii) Q is the cell membrane
(iii) R is spiracle
(iv) S is tracheae
(c) Organisms B and C
(d) Organism A,

76. 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 the 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) T is Amoeba as it lives in water and respire through cell membrane.
(b) Q is frog as it lives on land and water.
(c) P is fish as it has gills.
(d) S is grasshopper as it uses spiracles and trachea.
(e) R is earthworm as it lives on soil

77. 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) X is yeast (ii) Y is ethanol (iii) Z is carbon dioxide
(b) Fermentation
(c) X exhibits the anaerobic respiration.

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

- | | | | |
|---------------|---|-------------|-----------------------------------|
| (i) Glucose | → | Respiration | Ethanol + Carbon dioxide + Energy |
| (ii) Glucose | | Respiration | Carbon dioxide + Water + Energy |
| (iii) Glucose | | Respiration | Lactic acid + Energy |

- (a) Name one organism which respire according to equation (i) above.
(b) Name one organism which respire 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) Bacteria
- (b) Plants
- (c) In humans beings, in the muscle tissue the respiration represented by equation (iii) occurs. It occurs
- (d) Equation (ii)
- (e) Equation (i)
- (f) Aerobic respiration, produces maximum amount of energy.

79. 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
- D: bronchi
- E: lungs
- F: bronchioles
- G: alveoli

80. 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 is a human being. The breathing organs A are lungs.
- (b) Organism Y is a fish. The breathing organs B are gills.
- (c) Organism Z is a frog. The breathing organ C is skin and D are lungs.
- (d) (i) Z is an amphibian because it lives both on land and water.
(ii) Y is an aquatic organism because it lives only in water.
(iii) X is a terrestrial organism because it lives only on land.

Very Short Answer Questions

1. What is the name of tissues which transport:

- (a) food in a plant?**
- (b) water and minerals in a plant?**

Answer

- (a) Phloem transports the food in a plant.
- (b) Xylem transports water and minerals in a plant.

2. What substance/substances are transported in plants by:

- (a) xylem vessels and tracheid's?**
- (b) Sieve tubes (or phloem)?**

Answer

- (a) Xylem vessels and tracheid's transport water in plants.
- (b) Sieve tubes transport food in the plants.

3. Which organ acts as a pump in the circulatory system?

Answer

Heart acts as a pump in the circulatory system to push out blood.

4. 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 away from the heart.

(b) Veins carry blood back to the heart.

5. Where does blood absorb oxygen?

Answer

The blood absorbs oxygen in the lungs. Lungs are a vital part of the respiratory system. Alveoli helps blood to absorb oxygen in the lungs.

6. What stops blood from flowing backward through the heart?

Answer

The valves present in the right and the left atrium prevent the blood from flowing backward into the atria. The tricuspid valve mainly helps in doing this process.

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

Answer

(a) Aorta is the largest artery in our body.

(b) Vena cava is the largest vein in our body.

8. What gaseous waste products are excreted by plants?

Answer

Carbon dioxide, water vapor, and oxygen are the main gaseous waste products excreted by plants.

9. Where is the dirty blood in our body filtered?

Answer

The dirty blood is filtered by the kidneys in our body. Kidneys help in regulating and filtering minerals from blood.

10. Name the procedure used in the working of artificial kidney.

Answer

Dialysis is the procedure used in the working of artificial kidney. The main purpose of dialysis is to replace impaired renal function. When kidneys are damaged, they are no longer able to remove wastes and excess fluid from your bloodstream efficiently, dialysis does this

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

Answer

Blood includes the other four terms. Plasma, platelets, RBC and WBC are the major components of blood.

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

Answer

The transport system in the highly organized plants are Xylem and Phloem.

**13. Out of xylem and phloem, which one carries materials:
(a) upwards as well as downwards?
(b) Only upwards?**

Answer

- (a) Phloem
- (b) Xylem

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

Answer

Blood and lymph are two liquids that help in the transport of substances in human body.

15. What is the other name of main vein?

Answer

Vena cava is the other name of main vein.

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

Answer

The conducting tissue of plants that is made of the sieve tubes along with the companion cells is Phloem.

17. Name the conducting tissue in plants which is made of (a) living cells, and (b) dead cells.

Answer

- (a) Phloem
- (b) Xylem

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

Answer

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

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

Answer

ATP is utilized during the loading of food made in the leaves into the sieve tubes of phloem tissue. Thus, it is used in the transport of food.

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

Answer

The two types of transport system in human beings are blood circulatory system and lymphatic system.

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

Answer

(a) Oxygen is released only during daytime.

(b) Carbon dioxide is released only during the night.

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

Answer

Human beings have double circulation, fishes have single circulation of blood.

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

Answer

Through the leaves and the stems of plant the gaseous waste products are released.

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

Answer

When glucose enters nephron along with filtrate, the tubular cells absorb glucose, amino acids, salts, etc. These are then passed into the capillary blood cells using the process of diffusion.

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

Answer

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

27. What is the role of glomerulus in the kidney?

Answer

Glomerulus filters the blood passing through kidney. It is the first stage of filtering process in kidneys.

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

Answer

High blood pressure is also known as hypertension.

29. 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) Gums and resins are the waste products of plants.
(b) Bowman's capsule and tubule taken together make a nephron.
(c) The organs which extract the nitrogenous wastes from the blood are kidneys.
(d) The extracellular fluid which always flows from body tissues to the heart is called lymph.
(e) The white blood cells make antibodies whereas red blood cells help in respiration.

30. 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 in plants, which helps in the translocation of water and minerals. These are absorbed from the soil by the roots of the plants, to transport to various parts of the plant such as stems, leaves and flowers.

The two kinds of cells in xylem tissue are xylem vessels and tracheids. These cells are dead cells.

31. 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 conducting tissue in plants, which helps in the translocation of the food prepared in the leaves to all the other parts of the plant. Sieve tubes and companion cells are components of Phloem tissue. These cells are living cells.

32.(a) What is transpiration?

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

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

Answer

(a) The process of evaporation of water to the atmosphere from the leaves of a plant in the form of water vapor is called transpiration.

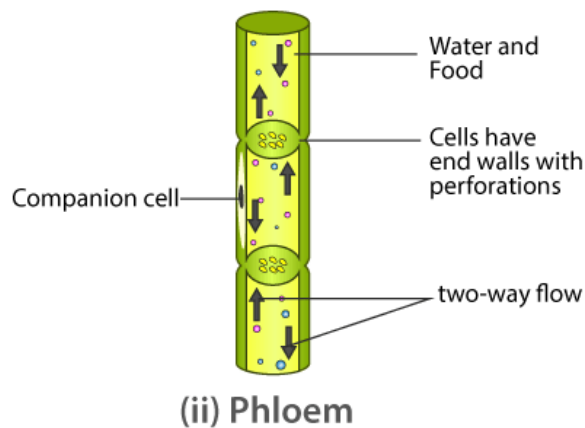
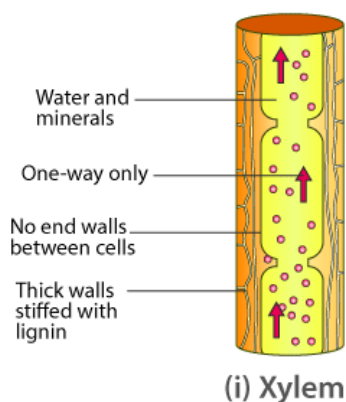
(b) Translocation is defined as the process of transport of food from the leaves to other parts of the plant.

(c) Phloem translocates the food prepared in the leaves.

**33.(a) Draw a labeled diagram of (i) a xylem vessel, and (ii) a sieve tube (or phloem).
(b) What are the differences between the transport of materials in xylem and phloem**

Answer

(a) Structure of a xylem vessel



(b)

Transport of materials in xylem	Transport of materials in phloem
---------------------------------	----------------------------------

Xylem helps in the translocation of water and minerals from the soil.	Phloem helps in translocation of food materials from the leaves to parts of the plant.
Xylem transports in one direction. It transports water only in an upward direction.	Phloem transports food in both directions, upwards and downwards.
Transpiration pull is required in the transportation.	ATP is required in the form of energy for transportation.

34. 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) Heart - Pumping organ
(ii) Arteries and Veins – Pipes for transport in humans
(iii) Xylem vessels – Water transport
(iv) RBC – Carrier of oxygen
(v) Platelets – Clotting of blood

35. Define excretion. Name the excretory unit of a kidney.

Answer

Excretion is the process of removal of waste products from the body. Nephrons are the excretory unit in kidney.

- 36. (a) What job is done by the kidneys?
(b) What do kidneys excrete?
(c) What is the name of the tubes which connect the kidneys to bladder?
(d) What does the bladder in our body do?**

Answer

(a) Kidneys filter the wastes out of the blood and form the urine. They also help in maintaining the water balance in the body.

(b) Kidneys remove urea, other soluble salts and excess water from the blood. These are removed from the blood in the form of urine.

(c) The tubes that connect kidneys to bladder are known as ureters.

(d) The urinary bladder helps in storing the urine until it is forced out of the body through an opening known as the urethra.

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

Answer

Kidneys help in the removal of major waste products like ammonia and urea. These are excreted regularly from our body with the help of kidneys. In the case of kidney failure, these wastes are not excreted and can cause harmful effects to the body. Then the blood is filtered externally by the process of dialysis. In this process the blood is purified externally. The impure blood is taken out of the body. Then in the dialysis machine it is purified and the pure blood is sent back to the body. This process is done periodically, depending on the condition of the patient.

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

Answer

Plasma is the liquid part of blood. The main function of the platelets is the clotting of blood. They contain essential chemicals that help in the excessive bleeding.

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

(b) Why does the heart need valves?

Answer

(a) There are three types of blood vessels in the human body namely, arteries, veins and capillaries.

(b) The heart needs valves to regulate the flow of blood. It helps in the movement of blood in a single direction.

40. A dialysis machine contains long tubes coiled in a tank containing dialyzing solution:

- (i) Of what substance are the tubes made?**
- (ii) What does the dialyzing solution contain?**
- (iii) Name the main waste which passes into the dialyzing solution.**

Answer

- (i) The tubes, which are selectively permeable membranes. These are made up of cellulose.
- (ii) The dialyzing machine contains water, glucose and salts. The concentration of these components are similar to the components present in the blood.
- (iii) Urea is the main waste that passes into the dialyzing solution.

41. State the differences between artery, vein and capillary.

Answer

Arteries	Veins	Capillaries
These are tough, thick and comprises of elastic tubes.	Veins are thin-walled and comprises of non-elastic tubes.	Capillaries are very thin-walled tubes.
They contain a narrow lumen.	They contain a wide lumen.	Only RBC can pass through lumen.
Blood is carried away from the heart to various organs at high pressure.	Blood is transported to the heart from various organs at low pressure.	Blood is carried from arteries to veins.
Valves are absent.	Valves are present to prevent backward flow of the blood.	Valves are absent.
They transport only oxygenated blood (except for the pulmonary artery).	They transport only deoxygenated blood (except for the pulmonary vein).	They exchange oxygen, carbon dioxide, water and salts between the blood and the surrounding tissues.

42. (a) What are the upper parts of the heart called?

(b) What are the lower parts of the heart called?

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

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

Answer

- (a) Atria.
(b) Ventricles.
(c) Capillary tubes connect arteries to veins.
(d) (i) The right side of the heart pumps blood into the lungs.
(ii) The left side of the heart pumps blood to the entire body, except the lungs.

43. (a) What are the methods used by plants to get rid of their waste products?
(b) How are waste products excreted in Amoeba?

Answer

- (a) Plants to get rid of their waste products by the following methods:

- The gaseous wastes are removed through stomata in leaves and lenticels in stems.
- Some of the waste products are excreted into the soil around them.
- Some of the waste are removed in the form of gum and resin.

- (b) In amoeba carbon dioxide is excreted by diffusion through the cell membrane, while excess water and nitrogenous waste like ammonia is removed by the contractile vacuole.

44. (a) What is lymph? State two major functions of lymph.
(b) What is meant by saying that the blood pressure of a person is 120/80?

Answer

- (a) Lymph is a clear, yellowish, slightly alkaline fluid, which contains white blood cells and the fluid resembles to plasma.

Functions of lymph:

- It helps in the defensive mechanism of the body by killing the foreign body with the help of lymphocytes and making antibodies.
- It transports nutrients from the tissue cells to the blood, through lymphatic vessels.

- (b) A reading of 120/80 means that the person has a normal blood pressure.

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

Answer

Hypertension is the other name of high blood pressure. High blood pressure is caused when there is constriction in arteries called arterioles. Arterioles regulate the blood flow through our body. As these arterioles constrict, the heart has to work harder to pump the blood through the smaller space. Due to this, the pressure inside the vessels grows. A very high blood pressure can lead to the rupture of artery and internal bleeding.

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

Answer

Following are the various components of blood:

(a) Plasma: Transportation of food, carbon dioxide, wastes and salts is carried by plasma.

(b) Erythrocytes (RBCs): They carry the oxygen from the lungs to all parts of the body.

(c) Leucocytes (WBCs): They fight infections and protect the body from foreign particles, like germs and bacteria.

(d) Platelets: They help in the coagulation of blood by releasing the chemicals that clot blood at the site of injury or wound.

47. 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 - Human circulatory system.

(ii) Glomerulus - Human excretory system.

(iii) Alveoli - Human respiratory system.

(iv) Villi - Human digestive system.

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

Answer

Systolic pressure: The pressure at which the blood leaves the heart through the aorta, during contraction phase.

Diastolic pressure: The minimum pressure in the arteries during the relaxation phase of the heart.

The normal value of systolic pressure is 120 mm Hg, while the normal diastolic pressure is 80 mm Hg.

**49. (a) What is meant by 'heartbeat'? What is the usual heartbeat rate at rest?
(b) What change occurs in heartbeats if a person runs for a while? Why?**

Answer

(a) Heartbeat is the sound produced when there is contraction and relaxation of the heart. At rest, the human heart usually beats 70 to 72 times per minute.

(b) A person's heart beats faster after running for a while or when a person is strained physically. After, the physical strain the person needs more oxygen. Hence the heart pumps faster.

**50. (a) What is blood? Why is it red?
(b) State the functions of blood in our body.
(c) Name a circulatory fluid in the human body other than blood.**

Answer

(a) Blood is a red color connective tissue that circulates in our body. Blood contains plasma, red blood cells, white blood cells and platelets. It is red in color because of the presence of hemoglobin.

(b) Following are the functions of blood

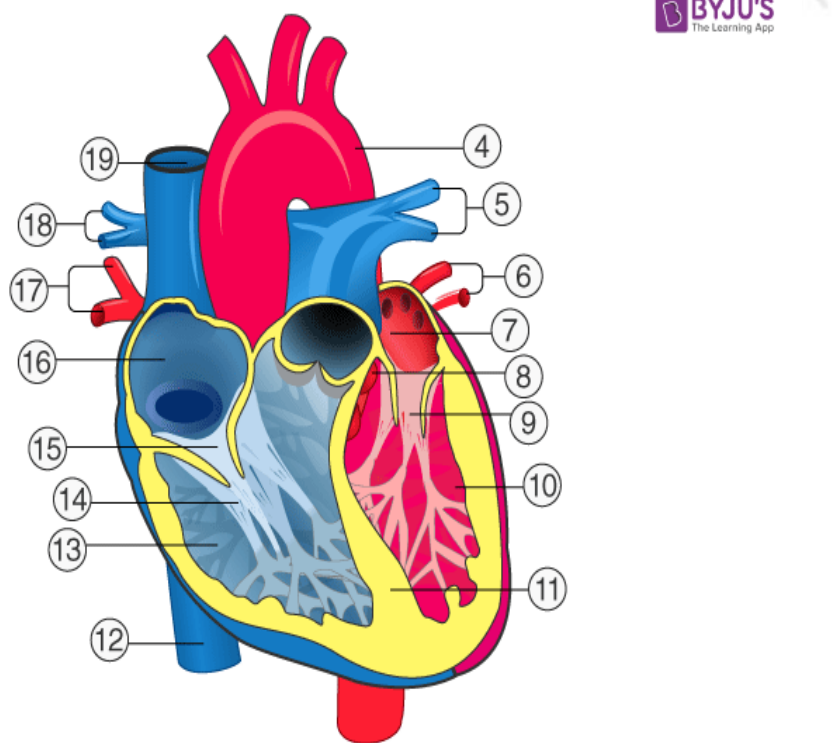
- Transportation of oxygen from lungs to all cells.
- Brings waste product like carbon dioxide from cells to lungs
- Fights against diseases and infections.
- Maintains the body temperature

(c) Lymph is a circulatory fluid in human body, other than blood.

**51. (a) What is meant by human circulatory system? Name the organs of the circulatory system in humans.
(b) Draw a diagram of the human heart and label its parts.
(c) What is meant by the terms 'single circulation' and 'double circulation'?**

Answer

(a) Human circulatory system is responsible for the transport of materials inside the human body. The organs of circulatory system are heart, arteries, veins and capillaries.



- | | | | |
|---------------------------|------------------------------|--------------------------|-----------------------|
| 1 Brachiocephalic Artery | 2 Left Common Carotid Artery | 3 Left Subclavian Artery | 4 Aorta |
| 5 Left Pulmonary Arteries | 6 Left Pulmonary Veins | 7 Left Atrium | 8 Semilunar Valves |
| 9 Atrioventricular Valve | 10 Left Ventricle | 11 Septum | 12 Inferior Vena Cava |
| 13 Right Ventricle | 14 Chordae Tendineae | 15 Atrioventricular | 16 Right Atrium |
| 17 Right Pulmonary Veins | 18 Right Pulmonary Arteries | 19 Superior Vena Cava | |

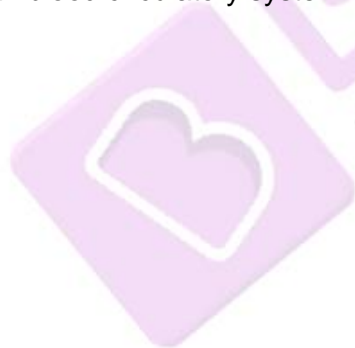
(c) Single circulation: A circulatory system in which the blood passes through the heart only once in one complete cycle is known as single circulation. It is commonly seen in fishes.

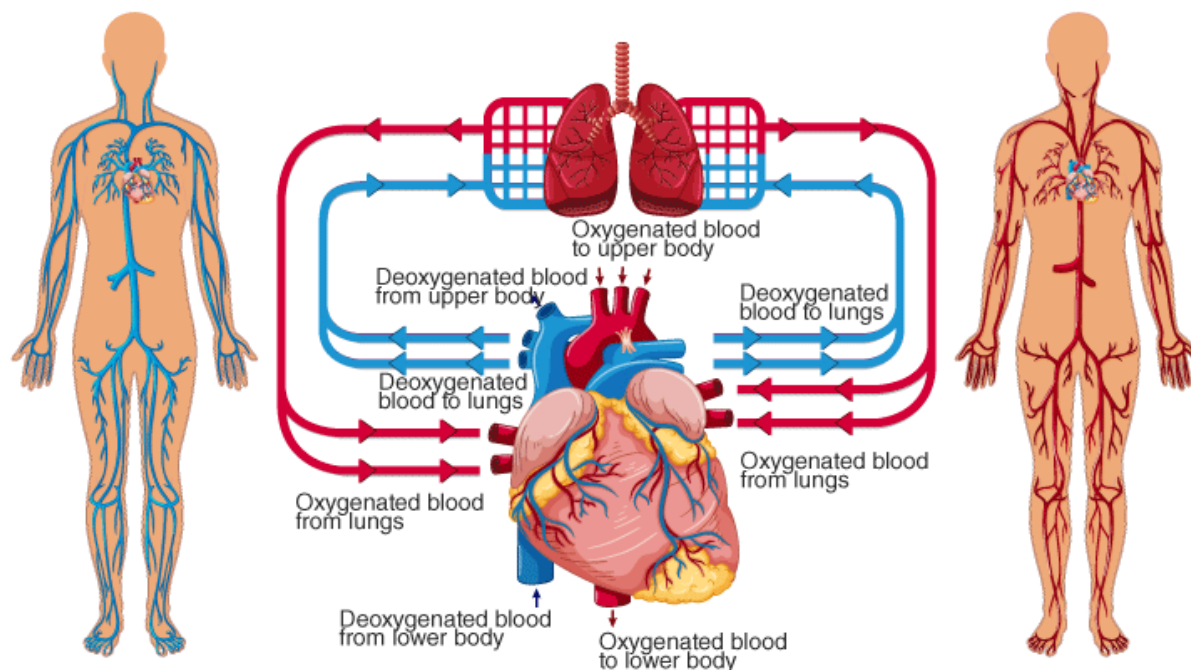
Double circulation: A circulatory system in which the blood travels twice through the heart in one complete cycle is known as double circulation. It is commonly seen in amphibians, reptiles, birds and mammals.

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

Answer

Working of human blood circulatory system:





The human blood circulatory system is composed of the heart, the blood and the blood vessels. The human heart is divided into four chambers. The upper two chambers are called right and left atrium and the lower two chambers are called the right and the left ventricles. Following are the steps involved in the blood circulation:

1. The left atrium receives the oxygenated blood from the lungs via the pulmonary vein.
2. When the left atrium contracts, the oxygenated blood is pumped into the left ventricle.
3. When the left ventricle contracts, the oxygenated blood is forced into the aorta, which transports the blood to all the parts of the body, except the lungs. When oxygenated blood passes through the capillaries of different organs, it gives oxygen to the body cells. Along with oxygen, blood also gives the digested food and other dissolved materials to the body cells. At the same time, carbon dioxide, which is produced as a waste material during respiration, enters into the blood.
4. From the body tissues, the deoxygenated blood carrying carbon dioxide is pumped back to the heart, into the right atrium, by the vena cava.
5. When the right atrium contracts, the deoxygenated blood is pumped into the right ventricle. From here, it is taken back to the lungs by the pulmonary artery for oxygenation.
6. The oxygenated blood is again sent to the left atrium of the heart by the pulmonary vein for being circulated in the body.

7. The whole process is repeated again and again so as the blood keeps circulating in our body and keeps circulating oxygen, digested food and other materials to all the parts of the body. This blood also keeps on removing waste products (in the form of deoxygenated blood) formed in the cells of the body.

- 53. (a) Name the red pigment which carries oxygen in the blood.**
(b) Why is it necessary to separate oxygenated and deoxygenated blood in mammals and birds?
(c) How many chambers are there in the heart of (i) an amphibian, (ii) a mammal, and (iii) a fish?
(d) Describe the circulatory system in a fish.

Answer

- (a) Hemoglobin is the red color pigment that carries oxygen in the blood.
- (b) It is necessary to separate the oxygenated and the deoxygenated blood in mammals and birds as this separation allows a highly efficient supply of oxygen to the blood cells. Humans are warm-blooded animals hence the separation of oxygenated and deoxygenated helps in regulating the body temperature.
- (c) (i) An amphibian: Has a three-chambered heart, with two auricles and one ventricle.
(ii) A mammal has a four-chambered heart. The upper two chambers are called atria and the lower two chambers are called ventricles.
(iii) A fish has only two chambers in its heart, i.e. one auricle and one ventricle.
- (d) A fish has a two-chambered heart with one auricle and one ventricle. Since both the auricle and ventricle remain undivided, only deoxygenated blood passes through it. The deoxygenated blood passes from the ventricles into the gills for oxygenation. The oxygenated blood from the gills is then passed to the body parts of the fish where oxygen is utilized and carbon dioxide enters it, thereby making the blood deoxygenated. The deoxygenated blood then returns to the heart to be pumped again into the gills for oxygenation.

- 54. (a) What is lymphatic system? What are its function?**
(b) What is blood pressure? What are the two factors used to express the blood pressure of a person?
(c) Name the main nitrogenous waste in the human blood. How is it removed from the blood?

Answer

- (a) The lymphatic system consists of network of organs, lymph nodes, lymph ducts and lymph vessels in the human body that make and move the lymph from tissues to the bloodstream.

Following are the functions of lymphatic system:

- Collects and transports tissue fluid from the intercellular spaces in all the tissues, back to the veins in the bloodstream.
- The defense mechanism in the body by killing the germs with the help of lymphocytes present in the lymph nodes and by making antibodies is the key function of the lymphatic system.

(b) Blood pressure is the pressure at which the blood is pumped around the body by the heart. It is always expressed in the form of two factors that are called systolic pressure and diastolic pressure.

(c) The main nitrogenous waste in the human blood is urea. The kidneys remove the urea from the blood and excrete them in the form of a dilute solution called urine.

55. (a) Name the various organs of the human excretory system.

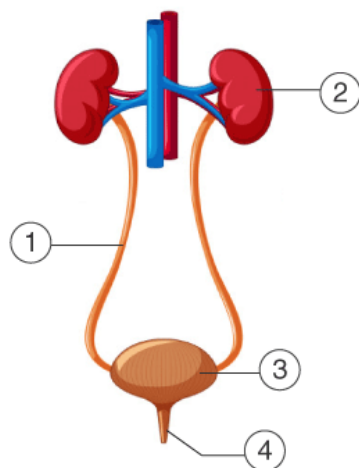
(b) Draw a neat labeled diagram of the human excretory system.

(c) What is the function of excretory system in humans?

Answer

(a) The human excretory system consists of two kidneys, two ureters, a bladder and a urethra.

(b) Diagram of the human excretory system:



1 Ureter | 2 Kidney | 3 Urinary bladder | 4 Urethra

(c) The main function of excretory system is to remove waste and harmful by-products of the normal metabolic processes from the body.

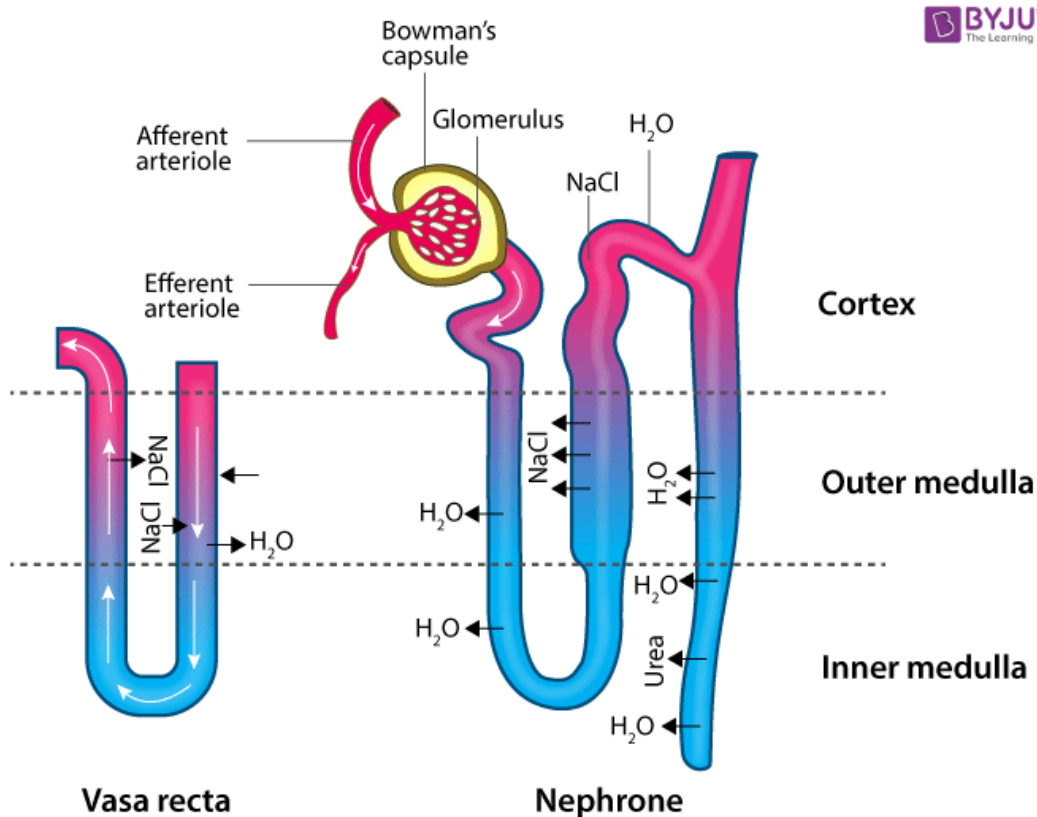
56. (a) Describe the mechanism of urine formation in human excretory system. Draw a labeled diagram to illustrate your answer.

(b) Where is urine carried through ureters?

(c) What is urethra?

Answer

(a) Kidneys are the main excretory organ of the human body. Each nephron contains a renal corpuscle and a renal tubule. The renal corpuscle consists of capillaries called the glomerulus, enclosed by a capsule called Bowman's capsule. The blood containing wastes enters the glomerulus and filters the blood. During filtration, the filtrate present in the blood moves through the renal tubule where necessary materials are reabsorbed. The nephron carries the urine into the collecting tubule of the kidney from where it is carried to the ureter. From the ureter, the urine passes into the urinary bladder. The urinary bladder stores the urine until it is forced out of the body, through an opening known as the urethra.



(b) Urine is carried into the urinary bladder through two narrow tubes that are called ureters.

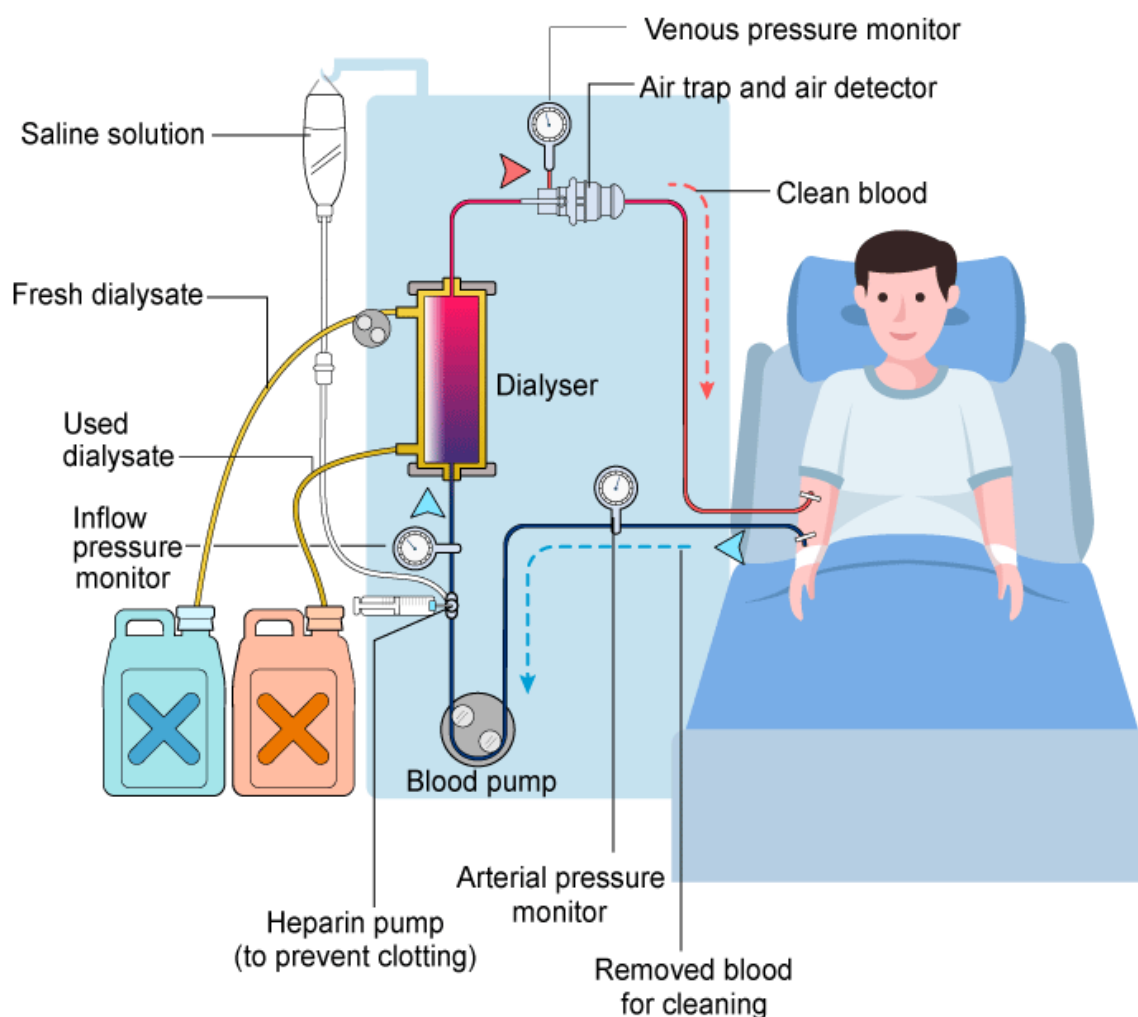
(c) Urethra is the small opening that carries urine out of the body.

57. (a) What is meant by dialysis? What type of patients are put on dialysis?
(b) Explain the principle of dialysis with the help of a labeled diagram.

Answer

(a) Dialysis is the process of removing waste substances like urea from the blood when a person is suffering from kidney failure. The machine draws the impure blood, purifies using a kidney machine and then it is sent back to the body.

(b) Principal of dialysis:



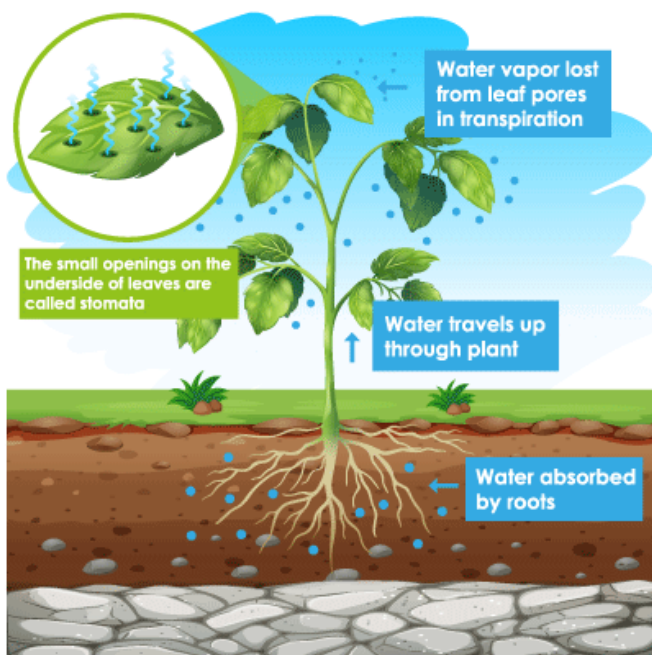
The procedure of dialysis is based on diffusion of solutes and ultrafiltration of fluid across a semi-

permeable membrane. In dialysis, the blood from a convenient artery is pumped into the dialyzer of a dialyzing machine. A dialyzer contains a coiled cellophane tube surrounded by the dialyzing solution. The dialyzing solution contains water, glucose and salts, which are similar in concentration to those in normal blood. The porous cellophane membrane of the tube allows the passage of molecules based on the concentration gradient. As the patient's blood is passed through the dialyzing solution, most of the wastes (like urea) present in it pass through the selectively permeable cellulose tubes into the dialyzing solution, thereby cleaning the blood. The clean blood is pumped back to the body through a vein.

- 58. (a) Why is the transport of materials necessary in an organism (plant or animal)?**
(b) What is the need for special tissues or organs for the transport of substances in plants and animals?
(c) How are water and minerals transported in plants?
(d) How is food transported in plants?

Answer

- (a) Transport of materials is necessary for plants and animals for the supply of oxygen and nutrients to all the cells present in the body.
(b) Organisms like plants and animals need special tissues and organs for the transport of substances because tissues and organs can easily transport the essential substances like food, oxygen and water from one part of the body to another in a multicellular organism.
(c) Water and minerals are absorbed by the cells of the root hair. The root hair is in direct contact with the water present between the soil particles. As the water is absorbed by the roots from the soil, it is transported to various parts of the plants through the xylem tubes. Then, there is a steady movement of water from the root xylem to all the parts of the plant, through interconnected water conduction elements.



(d) The transport of food from the leaves to the other parts of the plant occurs through the vascular tissue called phloem. The food (sugar) made in leaves is loaded into the sieve tubes of phloem tissue by using the energy derived from ATP. As a result, the osmotic pressure in the tissue increases, causing the water to move into it. This process is helpful in moving the food materials according to the needs of the plant.

Multiple Choice Questions

59. 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

- (a) red blood cell

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

- (a) platelets
- (b) white blood cell

- (c) red blood cells
- (d) plasma

Answer

- (b) white blood cells

61. 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

- (b) fish

62. Which of the following carries substances upwards as well as downwards in a plant?

- (a) xylem
- (b) companion cells
- (c) phloem
- (d) tracheid's

Answer

- (c) phloem

63. 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

- (c) sieve plates

64. 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

- (c) Excretory system

65. 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

- (c) Under the fan

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

- (a) artery**
- (b) vein**
- (c) capillary**
- (d) platelet**

Answer

- (b) vein

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

- (a) lungs**
- (b) ventricles**
- (c) atria**
- (d) nerves**

Answer

- (b) ventricles

68. The blood leaving the tissues becomes richer in:

- (a) carbon dioxide**
- (b) water**
- (c) hemoglobin**
- (d) oxygen**

Answer

- (a) carbon dioxide

69. What prevents the backflow 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

- (b) valves

70. 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

- (c) Kidney → ureter → bladder → urethra

71. In which of the following vertebrate group/groups, the 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

- (d) Pisces only

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

- (a) renal vein
- (b) pulmonary vein
- (c) vena cava
- (d) hepatic vein

Answer

- (b) pulmonary vein

73. Which blood vessel does not carry any carbon dioxide?

- (a) Pulmonary artery
- (b) vena cava
- (c) hepatic vein
- (d) pulmonary vein

Answer

- (d) pulmonary vein

74. 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

- (c) the low air pressure requires more red corpuscles to supply the body cells with oxygen.

75. 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

(c) sugar

76. Which of the following has a three-chambered heart?

- (a) pigeon
- (b) lizard
- (c) fish
- (d) lion

Answer

b) Lizard

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

- (a) Breathe
- (b) sweat
- (c) urine
- (d) feces

Answer

(c) urine

78. Which one of the following has cytoplasm but no nucleus:

- (a) xylem vessel
- (b) sieve tube
- (c) tracheid
- (d) companion cell

Answer

(b) sieve tube

79. 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

(c) translocation

80. Which of the following is the only conducting tissue in non-flowering plants?

- (a) xylem vessels
- (b) sieve tubes
- (c) companion cells
- (d) tracheid's

Answer

(d) tracheids

81. 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

(d) transpiration

82. Which one of the following does not have valves?

- (a) heart
- (b) arteries
- (c) capillaries
- (d) veins

Answer

(c) capillaries

83. 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

(a) transport of food

84. Coagulation of blood in a cut or wound is brought about by:

- (a) plasma
- (b) platelets
- (c) WBC
- (d) RBC

Answer

(b) platelets

85. 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

(d) pulmonary vein

86. The instrument for measuring blood pressure is called:

- (a) manometer
- (b) sphygmomanometer
- (c) barometer
- (d) potentiometer

Answer

(b) sphygmomanometer

87. The excretory unit in the human excretory system is called:

- (a) nephron
- (b) neuron
- (c) nephridia
- (d) kidneyon

Answer

(a) nephron

88. 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

(c) urea

89. 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

(c) dialysis

90. The excretory organs in an earthworm are:

- (a) nephridia**
- (b) nephrons**
- (c) raphides**
- (d) ureters**

Answers

(a) nephridia

91. The cells in our blood which destroy disease-causing germs, are:

- (a) platelets**
- (b) skin cells**
- (c) RBCs**
- (d) WBCs**

Answer

(d) WBCs

92. The wave of expansion of an artery when blood is forced into it is called:

- (a) flow
- (b) heartbeat
- (c) pulse
- (d) ticking

Answer

(c) pulse

93. In autotrophs, water is transported through:

- (a) root hair
- (b) phloem
- (c) stomata
- (d) xylem

Answer

(d) Xylem

94. An animal having double circulation in a three-chambered heart is:

- (a) fish
- (b) snake
- (c) deer
- (d) sparrow

Answer

(b) Snake