

**CBSE Class 10 Science
Important Questions
Chapter 6
Life Processes**

1 Marks Questions

1. Amoeba shows following kind of nutrition –

- (a) autotrophic
- (b) holozoic
- (c) saprotrophic
- (d) parasitic

Ans. (b) holozoic

2. The process by which blood is cleared of metabolic wastes in case of kidney failure is called

- a) artificial kidney
- b) dialysis
- c) transplantation
- d) filtration

Ans. b) dialysis

3. Woody plants carry gaseous exchange through

- a) root hair

- b) stem hair
- c) Lenticels
- d) epidermal cells.

Ans. (c) Lenticels

4. Where does digestion of starch begin in human body?

Ans. Mouth

5. Give one example each of saprophytic and parasitic nutrition.

Ans. Parasitic Nutrition – Plasmodium (Protozoa)
Saprophytic Nutrition – fungi

6. Which of the following statements about the autotrophs is incorrect?

- a) They store carbohydrates in the form of starch.
- b) They constitute the first trophic level in food chains.
- c) They convert CO_2 and water into carbohydrates in the absence of sunlight
- d) They synthesize carbohydrates from CO_2 and water in the presence of sunlight & chlorophyll.

Ans. c) They convert CO_2 and water into carbohydrates in the absence of sunlight

7. Which of these is not a part of the small intestine?

- a) *Duodenum*
- b) Jejunum
- c) Ileum
- d) Rectum

Ans. d) Rectum

8. During contraction of heart, what prevents backflow of blood?

- a) Thin walls of atria
- b) Thick muscular walls of ventricles
- c) Valves in heart
- d) All of the above

Ans. c) Valves in heart

9. Name excretory organ in amoeba and earthworm

**Ans. Amoeba – Cell membrane
Earthworm – Outer covering (skin)**

10. Name the plant tissue through which water and minerals are transported in plants.

Ans. Xylem

11. Trachea do not collapse when there is not much air because they are –

- a) thick and muscular
- b) having cartilaginous rings
- c) Have valves
- d) supported by larynx.

Ans. b) having cartilaginous rings

12. Which one of the following blood vessels contains only *deoxygenated* blood?

- a) pulmonary vein
- b) pulmonary artery
- c) capillaries

d) Aorta

Ans. b) pulmonary artery

13. The autotrophic mode of nutrition requires –

a) Chlorophyll

b) Sunlight

c) Carbon – dioxide & water

d) all of the above

Ans. d) all of the above

14. Name the red pigment carrying oxygen in blood.

Ans. Haemoglobin

15. Name the hormone which is responsible for reabsorption of water in nephrons.

Ans. Anti – diuretic – hormone (ADH) or vasopressin

16. When air is blown from mouth into a test – tube containing lime water, the lime water turned milky due to presence of –

a) oxygen

b) nitrogen

c) water vapours

d) carbon – dioxide

Ans. d) carbon – dioxide

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

- a) Pisces only
- b) Amphibians only
- c) Amphibians and reptiles only
- d) Pisces and amphibians.

Ans. a) Pisces only

18. The filtration units of kidneys are called –

- a) Ureter
- b) Urethra
- c) Neurons
- d) nephrons.

Ans. D) nephrons

19. What is the mode of nutrition in fungi and plasmodium?

Ans. Fungi – Saprophytic
Plasmodium – parasitic

20. Which of them contain less nitrogenous waste – renal vein or the renal artery?

Ans. Renal vein

21. Amoeba captures food with the help of –

- a) teeth
- b) cilia
- c) pseudopodia
- d) tentacles

Ans. c) pseudopodia

22. Which of the following is most appropriate for aerobic respiration?

a) Glucose $\xrightarrow{\text{mitochondria}}$ pyruvate $\xrightarrow{\text{cytoplasm}}$ $CO_2 + H_2O + \text{Energy}$.

b) Glucose $\xrightarrow{\text{cytoplasm}}$ pyruvate $\xrightarrow{\text{mitochondria}}$ $CO_2 + H_2O + \text{Energy}$.

c) Glucose $\xrightarrow{\text{cytoplasm}}$ pyruvate + Energy $\xrightarrow{\text{mitochondria}}$ $CO_2 + H_2O$

d) Glucose $\xrightarrow{\text{cytoplasm}}$ pyruvate + Energy $\xrightarrow{\text{mitochondria}}$ $CO_2 + H_2O + \text{Energy}$

Ans. Glucose $\xrightarrow{\text{cytoplasm}}$ pyruvate $\xrightarrow{\text{mitochondria}}$ $CO_2 + H_2O + \text{Energy}$.

23. Name the part of alimentary canal receiving bile from the liver.

a) Oesophagus

b) Stomach

c) Small intestine

d) Large intestine

Ans. c) Small Intestine.

24. What is glycolysis?

Ans. Breakdown of Glucose into pyruvate is known as glycolysis

25. Name the largest artery of body.

Ans. Aorta

26. The kidneys in human beings are parts of the system for

(a) nutrition

(b) respiration

(c) excretion

(d) transpiration

Ans. (c) excretion

27. The xylem in plants are responsible for

- (a) transport of water**
- (b) transport of food**
- (c) transport of amino acids**
- (d) transport of oxygen**

Ans. (a) transport of water

28. The autotrophic mode of nutrition requires

- (a) carbon dioxide and water**
- (b) chlorophyll**
- (c) sunlight**
- (d) all of the above**

Ans. (d) all of the above

29. The breakdown of pyruvate to give carbon dioxide, water and energy takes place in

- (a) cytoplasm**
- (b) mitochondria**
- (c) chloroplast**
- (d) nucleus**

Ans. (b) mitochondria

30. Food moves down the gut by peristalsis. Which region of brain controls peristalsis.

Ans. Medulla of hind brain.

31. Name the pigment present in plants, which can absorb solar energy.

Ans. Chlorophyll.

32. Which of the four chambers of the human heart has the thickest muscular walls?

Ans. Right ventricle.

33. Which part of visible spectrum is absorbed by chlorophyll pigments?

Ans. Blue and Red light

34. Name the cartilaginous flap which closes the glottis to check the entry of food into it during swallowing.

Ans. Epiglottis

35. Which equipment is used to facilitate breathing during serious breathing problems?

Ans. Ventilator

36. What do you mean by double circulation of blood?

Ans. Blood passes through the heart twice for each cycle of the body.

2 Marks Questions

1. What is common for cuscuta, ticks and leeches?

Ans. Cuscuta, ticks and leeches, all has parasitic mode of nutrition, they harm their host while taking nutrition.

2. What advantage over an aquatic organism does a terrestrial organism have with regard to obtaining oxygen for respiration?

Ans. Adaptation of terrestrial organism over aquatic organism for efficient uptake of oxygen from air –

(i) Increased respiratory surface area.

(ii) Very fine and delicate surface for easy exchange of oxygen and carbon – dioxide.

(iii) Placement of respiratory surface within the body for protection

(iv) Mechanism for moving the air in and out of respiratory surface where the oxygen is absorbed.

3. Differentiate between single and double circulation found in vertebrates.

Ans.

Single Circulation	Double Circulation
1. In this, blood passes only once through the heart in one complete cycle	Blood passes, twice through the heart in one complete
2. Heart has only deoxygenated blood	Heart has both oxygenated and deoxygenated blood
3. It is less efficient	It is more efficient

4. Name the substrates for the following enzymes

- a. **trypsin**
- b. **amylase**
- c. **pepsin**
- d. **lipase**

Ans. a) Protein

b) Starch

c) Protein

d) Lipids

5. What are the two stages in photosynthesis?

Ans. Two stages in photosynthesis –

a) Light reaction – Light energy breaks up water molecular into hydrogen and oxygen, called photolysis of water

b) Dark reaction – Fixation and conversion of carbon – dioxide (CO₂) into a simple carbohydrates glucose.

6. What is the difference between arteries & veins?

Ans.

Arteries	Veins
1. It carries blood away from the heart.	It carries blood towards the heart.
2. They are thick walled.	They are thin walled
3. They have narrow lumen	They have wide lumen
4. Pressure is high	Pressure is low
5. It carries oxygenated blood.	It carries deoxygenated blood.

7. What is villi? What are its functions?

Ans. Finger like projection present in the inner lining of small intestine are called villi. They increase the surface area for the absorption of digested food in the small intestine.

8. What type of respiration takes place in human muscles during vigorous exercise and why?

Ans. During vigorous exercise, anaerobic respiration takes place in human muscles. During exercise our energy requirement increase, so our striated muscles start respiring anaerobically in the lack of oxygen and produces ATP molecules.

9. How is opening and closing of stomata regulated?

Ans. The closing and openings of the stomata is regulated by guard cells. When the guard cells swell or turgid due to entry of water, the stomata are opened. The guard cells shrink due to loss of water the stomata get closed.

10. State two vital functions of kidney.

Ans. Function of kidney are –

1. It maintains water balance in the body tissues.
2. It controls calcium levels in the blood to maintain healthy bones.

11. Differentiate between aerobic and anaerobic respiration.

Ans.

Aerobic Respiration	Anaerobic Respiration
a) It occurs in the presence of oxygen	a) It occurs in the absence of oxygen
b) It occurs in cytoplasm and in the mitochondria	b) It occurs in cytoplasm
b) Complete breakdown of glucose	c) Incomplete breakdown of glucose
d) End products are CO_2 and H_2O	d) End products are CO_2 and ethyl alcohol or lactic acid

12. Meat is easier to digest as compared to grass. Why?

Ans. It is easier to digest meat because our digestive juices contain enzymes which can easily digest meat but our body does not digest cellulose which is a main component of grass.

13. Differentiate between transport of materials in xylem & phloem

Ans.

Xylem	Phloem
a) It transport water and minerals	a) It transport food materials
b) Transport of substances in upwards direction only.	b) Transport of substances in both directions upward & downward

14. What is the role of glomerulus in kidney?

Ans. Glomerulus is a group of capillaries present in the cup like Bowman's Capsule. It receives blood from renal artery which brings excretory wastes from body to the kidney. It filters water, salts, glucose, urea, the nitrogen containing end products of proteins and yellow bile compounds from the liver.

15. Why is it essential to match the blood groups of donors and receiver person before arranging transfusion of blood?

Ans. RBC's of blood carries antigen as well as antibody. If blood is not matched before transfusion then blood of receiver start producing antibodies against donor blood and destroys blood cells, this causes deficiency of blood and causes death.

16. Why is it necessary to separate oxygenated & deoxygenated blood in mammals & birds?

Ans. Separation of oxygenated and deoxygenated blood allows good supply of oxygen to the body. This system is useful in animals that have high energy requirement Mammals and birds constantly need oxygen to get energy to maintain constant body temperature

17. Why the walls of trachea are supported by cartilaginous rings?

Ans. The trachea is supported by cartilaginous rings which prevent the collapsing even when there is not much air in it.

18. What are the raw materials for photosynthesis?

Ans. Raw materials for photosynthesis are –

- a. Carbon – dioxide
 - b. Water
 - c. Chlorophyll and Sunlight
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19. What is the role of diaphragm during inhalation and exhalation?

Ans. Diaphragm changes its shape during inhalation and exhalation and increases and decreases volume of thoracic cavity respectively. This causes entry and expel of air from lungs.

20. What is the advantage of four chambered of heart?

Ans. The right and left parts are separated by a septum to prevent oxygenated and deoxygenated blood from mixing. This fulfills the constant use of energy to maintain their body temperature. Their energy needs are high, which are fulfilled efficiently because of non – mixing of oxygenated & deoxygenated blood.

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

Ans. As in multicellular organisms, all the cells are not in direct contact with environment, simple diffusion does not meet the requirement of all the body cells.

22. What criteria do we use to decide whether something is alive?

Ans. All the living organism must have movement at molecular levels along with respiration and other life process like nutrition, respiration, transportation and excretion to be called alive.

23. What is the function of digestive enzymes?

Ans. Enzymes break-down the various complex components of food into simple and soluble components so that they can be absorbed easily.

24. How are the lungs designed in human beings to maximize the area for exchange of gases?

Ans. In lungs, the bronchioles terminate in balloon-like structures called alveoli. The alveoli contain network of blood capillaries that increase the surface area for exchange of gases.

25. What is the role of saliva in the digestion of food?

Ans. The saliva contains an enzyme called salivary amylase that breaks down starch which is complex molecule into glucose.

26. While eating you are advised not to talk Why are you advised so?

Ans. We are advised so because while eating some food particles might enter the wind pipe which can lead to choking.

27. We say that movement is a characteristic of living organisms but we always don't see visible movements in plants. Comment.

Ans. We always don't see visible movements in plants. It does not mean that they are not alive.

Molecular movements take place in their body.

28. If a person is working on a treadmill in a gymnasium, will it effect his rate of breathing? How?

Ans. Yes, it will affect his rate of breathing. The rate of breathing will become fast to supply more oxygen to meet the increased demand of energy.

29. If you compare your rate of breathing by feeling your chest movement with the number of times a fish opens and closes its mouth. Which will be higher and way?

Ans. The number of times a fish opens and closes its mouth will be higher as the amount of dissolved oxygen in water is fairly low compared to the amount of oxygen in the air. Therefore, rate of breathing in aquatic organisms is much faster than in terrestrial organisms.

30. Mucus is not used for churning the food or digesting it. Then why is it secreted in the stomach?

Ans. Mucus is secreted in the stomach to protect its inner lining from being damaged by HCl. Excessive secretion of HCl can damage the lining and lead to peptic ulcer.

31. In the process of Photosynthesis food A is prepared which gets converted into food B. What are A and B? Why is A converted to B?

Ans. Food A is glucose and food B is Starch.

A is converted to B as B is insoluble form of carbohydrate. It is more compact and hence, suitable for storage.

32. When we are asleep we are not performing any activity still our life processes are going on. Why?

Ans. "The maintenance functions of living organisms must go on even when they are not doing anything particular." That is why the life processes are going on even while we are asleep or not performing any activity.

33. What will be the outcome if a farmer floods his field everyday?

Ans. Respiration of plants will be affected because the oxygen present in the interspaces of the soil will be replaced by water.

34. Name the respiratory organs of (i) fish (ii) mosquito (iii) earthworm.

Ans. Fish - gills
Mosquito - (air tubes)
Earthworm - moist skin

35. Due to availability of less water, how does the plant cope up with lack of water in desert conditions?

Ans. They open their stomata at night and stomata remain closed during day time, to conserve moisture.

36. After a vigorous exercise, you may experience cramps in your leg muscles. Why does this happen?

Ans. The sudden build up of lactic acid in our muscles during vigorous, exercise, causes muscular cramps in our leg muscles.

37. What will happen if carbon monoxide combines with hemoglobin?

Ans. If the hemoglobin binds with carbon monoxide strongly, the oxygen will not be carried with blood leading to death of the organism.

38. Chloroplast are called energy convertors. Explain.

Ans. Chloroplasts are called energy convertors because they trap the solar energy and convert it into chemical energy.

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

Ans. The aquatic organisms obtain oxygen dissolved in water. As compared to air, the availability of oxygen in water is fairly low. Hence, the aquatic organisms have to breathe faster as compared to the terrestrial organisms.

40. Why are glomeruli considered as dialysis bags?

Ans. The main function performed by the glomeruli is selective filtration. They filter small molecules containing glucose, salts, urea, and liquid serum. Etc. The large molecules such as proteins remain in blood. Thus, glomeruli of the kidneys function as dialysis bags.

41. Autotrophs synthesis food for the living world. Justify this statement in one sentence only interconnecting autotrophs and heterotrophs.

Ans. The food producers are autotrophs and all the heterotrophs consume the food produced by the autotrophs directly or indirectly.

42. Veins and arteries carry blood. Which of these carry blood?

- a. Away from the heart?
- b. Back to the heart?

Ans. a) Arteries carry blood away from the heart.
b) Veins carry blood back to the heart.

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

- i. Absorption of food.
- ii. Absorption of water

Ans. i. Absorption of food takes place in small intestine.
ii. Large intestine

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

Ans. In woody stem, the bark has lenticels for gaseous exchange.

45. Why doesn't the lungs collapse even after forceful expiration?

Ans. Even after forceful expiration to the maximum capacity, some amount of air remains in the lungs, known as residual volume. So, the lungs doesn't collapse even after forceful expiration.

46. "If there were no algae there would be no fish in the sea". Comment.

Ans. Algae produce O_2 as a result of photosynthesis. This oxygen is utilized by the fishes in the sea for carrying out respiration. If there were no algae, no oxygen would have been produced. Thus, fishes might have died.

47. Why is the process of diffusion insufficient to meet the oxygen requirement of human beings?

Ans. The process of diffusion for carrying O_2 to all parts of the body is not sufficient for larger multicellular organisms like human beings. Hence, respiratory pigment hemoglobin takes up oxygen from the air and carry it to all the parts of our body through blood.

3 Marks Questions

1. What are the functions of lymph in our body?

Ans. Functions of lymph are-

a) It returns tissue fluid from interstitial space into the blood.

b) It collects carbon dioxide, waste products and metabolites from tissues via tissue fluid.

c) Lymph has lymphocytes (WBC'S), the lymph provides in immunity to the body and fight against the invading organisms.

2. How is haemoglobin associated with respiration explained?

Ans. Transportation of oxygen and carbon – dioxide occurs with the help of respiratory pigment haemoglobin. Haemoglobin is a red pigment having very high affinity for oxygen. Oxygen is transported from the lungs to the body cells in the form of oxyhemoglobin. Carbon – dioxide is transported from the body cells to the lungs in the form of carbamino – haemoglobin

3. What are the modes of excretion in plants?

Ans. Modes of excretion in plants are –

- a) The plants get rid of excess water by transpiration.
 - b) The only major gaseous excretory product of plants is oxygen. It is released from plants into the environment by diffusion.
 - c) Organic wastes of plants are stored within dead permanent tissues such as wood or within leaves or bark which are periodically removed.
 - d) The plants also excrete some waste substances into the soil around them.
 - e) Many waste products of plants are stored in cellular vacuoles.
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4. Give an experiment to prove the essentiality of light for photosynthesis

Ans. a) Destarched the plant by leaving it in dark for 48 – 72 hours.

b) Now place strips of black paper or metal foil over destarched leaves and expose them to light for several hours.

5. What is “translocation”? Why it is essential for plants.

Ans. Transportation of organic solutes in the plants is called translocation. It is necessary, because all the cells need food to carry out their vital functions. It occurs in upward as well as downward direction or to the storage organs of roots, fruits, seeds and to growing organs.

6. How respiration does takes place in plants?

Ans. There are three modes for the exchange of gases in plants –

- a) Some small plants can carry out gaseous exchange by simple diffusion over their whole surfaces.
 - b) Large flowering plants exchange gases through stomata on their leaves and green stem.
 - c) In woody stems, exchange occurs through cracks in the bark or lenticels.
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7. How is transpiration pull responsible for upward movement of water?

Ans. The leaves lose water in the form of water vapours through stomata by a process known as transpiration. Continuous transpiration creates a suction in the water column of the xylem elements and it reaches up to the roots. This pull is called transpiration pull. Due to transpiration, the water column of the plant is pulled up from below to the top of the plant.

8. Discuss the major steps involved in process of nutrition in human beings.

Ans. Major steps involved in human nutrition are –

a) Ingestion – Intake of food through mouth. Humans have holozoic mode of nutrition. They engulf solid particles.

b) Digestion – The breakdown of complex food material into simpler one in alimentary canal with the help of mechanical as well as chemical process.

c) Absorption – Digested food is absorbed by the small finger-like projections, villi present in the small intestine.

d) Assimilation – Absorbed food reaches to all cells via blood, and utilized for energy, growth and development.

e) Excretion – Undigested food from small intestine passed into large intestine, and then it is thrown out by Anus.

9. Discuss the mode of nutrition in amoeba.

Ans. Steps of Nutrition in amoeba –

a) Formation of pseudopodia – When Amoeba comes in contact with a food particle, it forms pseudopodia which envelops food particles.

b) Ingestion – The tips of pseudopodia fuse with each other, together with variable amount of food particles and water, forms food vacuole, this process is known as ingestion.

c) Digestion – The vacuoles are surrounded by lysosomes which fuse with vacuole and digest the food particles present in vacuole.

d) Exocytosis – The soluble products of digestion are passed out into the cytoplasm from the food vacuole. And the remaining undigested materials are passed out of the body with the help of a process called exocytosis.

10. With the help of labelled diagram, discuss the structure of cross – section of leaf.

Ans. Leaf has two parts:

(i) Epidermis – Outermost layer of cell is called epidermis. Lower epidermis has small pores in between cells called stomata.

(ii) Mesophyll – Parenchymatons cells containing chloroplast is called mesophyll. It is two types – palisade and spongy parenchyma.

11. What do you mean by 'lymph'. Mention its function.

Ans. Lymph- The fluid present in the spaces between the cells in the tissues is called tissue fluid or lymph.

Functions of lymph:

(i) It returns tissue fluid from the interstitial spaces into the blood.

(ii) Lymph capillaries of intestinal villi called lacteals helps in absorption of fats.

(iii) It collects carbondioxide, waste products and metabolites form tissues via tissue fluid.

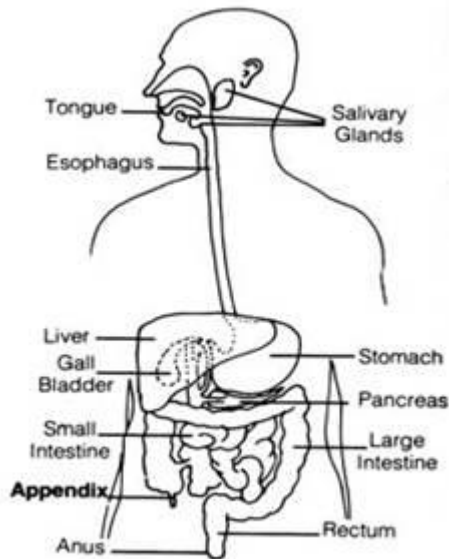
12. How are lungs designed in human beings to maximize the area of exchange of gases

Ans. Lungs have some adaptations in them so that efficient exchanges of gases take place. The adaptations are –

a) Increased surface area

b) Very fine and delicate surface for easy exchange of oxygen and carbon dioxide

c) Mechanism for moving the air in and out of respiratory surface where the oxygen is absorbed.



13. Dark reaction of photosynthesis does not need light. Do plants undergo dark reaction at night explain.

Ans. Dark reaction does not mean that it occurs in the absence of light i.e., at night. Infact these reactions do not depend on light energy and occur simultaneously with light reaction.

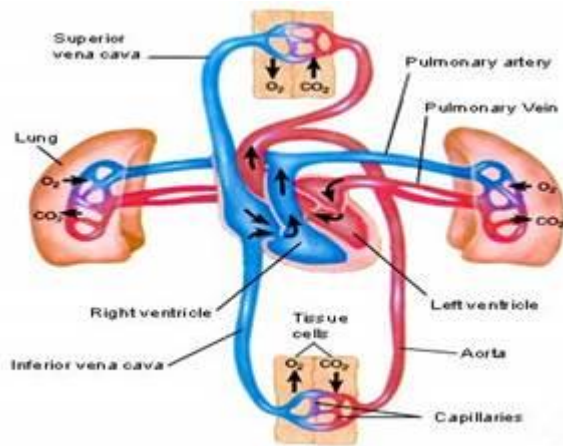
14. Differentiate inhalation and exhalation.

Ans.

Inhalation	Exhalation
It is taking in of air from the atmosphere	It is expelling out of air from the lungs.
Diaphragm contract & flattens.	Diaphragm relaxes and becomes dome shaped.
Ribs movement is forward & outward.	Ribs movement is downward & inward
Volume of thoracic cavity increases	Volume of thoracic cavity decreases
Pressure of thoracic cavity decreases	Pressure of thoracic cavity increases

15. With the help of diagram, show pulmonary circulation in man.

Ans. Diagram – Pulmonary circulation in man.



16. What are the functions of human respiratory system?

Ans. (i) Gaseous exchange for the cellular respiratory process.

(ii) Sound production by vocal cords

(iii) Abdominal compression which helps in urination, passing of faeces and childbirth.

(iv) Laughing and sneezing for self-cleaning the respiratory surface.

17. What is role of skin, lungs and intestine in the process of excretion in man?

Ans. Skin – Skin excrete excess salts and water in the form of sweat.

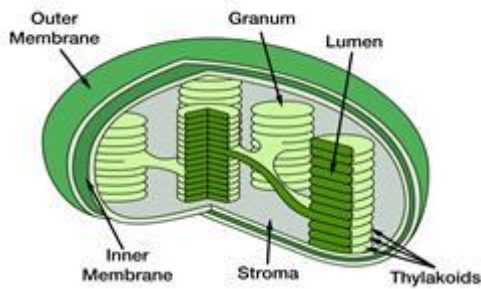
Lungs – Lungs expel carbon – dioxide during exhalation.

Intestine – Intestine throw out undigested food in the form of faeces through anus

18. Explain the structure of chloroplast.

Ans. Fig – structure of chloroplast.

Chloroplast



19. Why and how does water enter continuously into the root xylem of plants?

Ans. Xylem transports water and minerals to the plant body. The roots of a plant have hair called root hairs. The root hairs are directly in contact with the film of water in between the soil particles. Water and minerals get into the root hair by the process of diffusion. The water and minerals absorbed by the root hair form the soil pass from cell to cell by osmosis through the epidermis root cortex, endodermis and reaches the root xylem. The xylem vessels of the root the plant are connected to the xylem vessels into stem.

Therefore, the water containing dissolved minerals enter the root xylem vessels into stem xylem vessels. The xylem vessels of the stem branch into the leaves of the plants. So the water & minerals carried by the xylem vessels in the stem reach the leaves through the branched xylem vessels which enter from the petiole into the each part of the leaf. Thus the water and minerals from the soil reach through the root and stem to the leaves of the plants.

Evaporation of water molecules from the cells of a leaf creates a suction which pulls water from the xylem cells of roots. The loss of water in the form of vapour from the aerial parts of the plants is known as transpiration.

20. What is the role of following in human digestive system –

a) mucous

b) Bicarbonate

c) Trypsin

Ans. a) Mucus – It protects the inner lining of stomach from HCl.

b) Bicarbonate – It makes the acidic food alkaline so that pancreatic enzymes act on it.

c) Trypsin – It digests proteins into amino acids.

21. What are outside raw materials used for by an organism?

Ans. Outside raw materials used for by an organism includes:

- a. Food
 - b. Water
 - c. Oxygen
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22. What processes would you consider essential for maintaining life?

Ans. The processes essential for maintaining life are

- a. Nutrition
 - b. Respiration
 - c. Transportation
 - d. Excretion
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23. What are difference between autotrophic and heterotrophic nutrition?

Ans. Distinction between autotrophic and heterotrophic nutrition:

Autotrophic Nutrition	Heterotrophic Nutrition
The mode of nutrition in which an organism makes its own food from the simple inorganic materials like carbon dioxide and water present in the surroundings with the help of sunlight energy. All green plants.	The mode of nutrition in which an organism cannot makes its own food from the simple inorganic materials like carbon dioxide and water present in the surroundings and depends on other organisms for food. All non- green plants.

24. Where do plants get each of the raw materials required for photosynthesis?

Ans. (a) Carbon dioxide from atmosphere.

(b) Light from Sun

(c) Water from Soil

(d) Chlorophyll from chloroplast of green plants.

25. What is the role of the acids in our stomach?

Ans. HCl plays following role in our stomach:

(a) Make the medium acidic for action of enzyme pepsin.

(b) Kills the harmful bacteria present in food

(c) Prevents fermentation of food

26. How is small intestine deigned to absorb digested

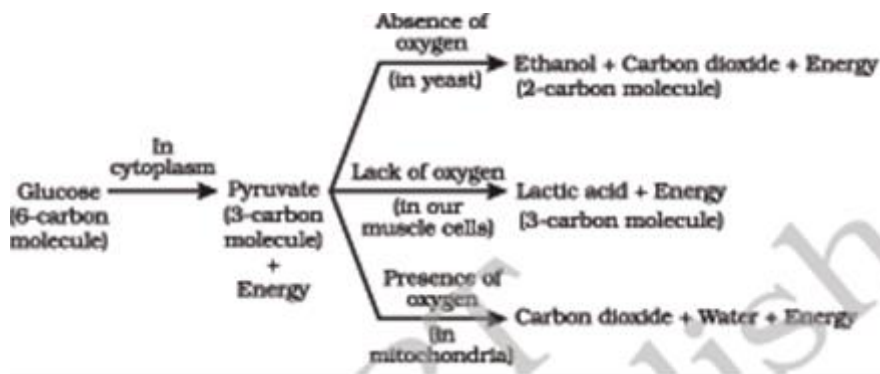
Ans. The inner lining of small intestine has numerous finger-like projections called villi which increase the surface area for absorption. The villi are richly supplied with blood vessels which transport the absorbed food to each and every cells of the body. Where, it is utilized to obtaining energy and repair of old tissues.

27. What advantage over an aquatic organism does a terrestrial organism have with regard to obtaining oxygen for respiration?

Ans. The rate of breathing is slower in terrestrial organisms as compared to aquatic organisms. This is due to the fact that in water, the amount of oxygen is less as compared to air while in aquatic organisms the rate of breathing is faster.

28. What are different ways in which glucose is oxidized to provide energy in various organisms?

Ans. The pathways of break-down of glucose in various organisms are as below:



29. How is oxygen and carbon dioxide transported in human beings?

Ans. In human beings, a pigment hemoglobin is present in RBC which has high affinity for oxygen, takes up the oxygen from the air in the lungs and carry it to tissues which are deficient in oxygen. Some oxygen is carried in dissolved state in blood plasma. Carbon dioxide is more soluble in water than oxygen is mostly transported in the dissolved form in our blood.

30. What are the components of the transport system in human beings? What are the functions of these components?

Ans. The components of human transport system include:

- (a) Heart- receives and pumps the blood.
- (b) Arteries- carry oxygenated blood away from the heart to various organs.
- (c) Veins- Bring back blood to heart.
- (d) Capillaries- exchange of various materials and gases between blood and tissues.

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

Ans. The separation of the right and left side of heart is useful to prevent oxygenated blood and deoxygenated blood from mixing. Such separation allows a highly efficient supply of oxygen to the body. This is useful in animals that have high energy needs, such as birds and mammals that constantly use the energy to maintain their body temperature.

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

Ans. The transport system of higher plants consists of xylem and phloem. Xylems have vessels and trachieds to transport water and minerals from root to other part of the plants.

Phloem, which consists of sieve tubes and companion cells, transport food from leaves to storage organs and other parts of plant.

33. How are water and minerals transported in plants?

Ans. Water and minerals are transported in plants through xylem which consists of trachieds and vessels. Water and minerals absorbed by root hairs present in root by osmosis is passed to xylem tissues of root. From root xylem it passes to stem xylem and thus water reaches to leaves.

34. How is food transported in plants?

Ans. Food is transported in plants through phloem which consists of sieve tubes, sieve cells and companion cells. The food prepared in leaves in soluble form transported to leaves phloem. Active transport of food passes to all other parts of plants.

35. What are the methods used by plants to get rid of excretory products?

Ans. (i) Plant produces carbon dioxide as wastes during respiration and oxygen as waste during photosynthesis.

(ii) Excess of water is removed through transpiration.

(iii) Some waste products like gums and resins are stored in older xylem tissue.

36. How is amount of urine produced regulated?

Ans. The amount of urine depends on how much excess of water is in the body and how much a water soluble waste is to be excreted. If the amount of water and dissolved wastes in boy are more than amount of urine will be more and if amount of wastes is less the amount of urine produced will be less.

37. How are fats digested in our bodies? Where does this process take place?

Ans. Digestion of fats takes place in small intestine. Fats entering in intestine are in the form of large globules. Bile juice breaks down these large globules into smaller globules. Afterwards fat digesting enzyme lipase present in pancreatic juice and intestinal juice converts it into fatty acids and glycerol.

38. What are the necessary conditions for autotrophic nutrition and what are its by-products.

Ans. Conditions necessary for autotrophic nutrition are:

- (i) Light
- (ii) Chlorophyll
- (iii) Water and
- (iv) Carbon dioxide

By-products are:

- (i) Oxygen and
 - (ii) Water
-

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

Ans. Difference between aerobic and anaerobic respiration:

Aerobic respiration	Anaerobic respiration
(i) Takes place in presence of oxygen.	(i) Takes place in absence of oxygen
(ii) Complete oxidation of glucose occurs.	(ii) Incomplete oxidation of glucose occurs.
(iii) More energy is produced.	(iii) Less energy is produced

Anaerobic respiration takes place in yeast, some bacteria and some internal parasites like tapeworm.

40. How are the alveoli designed to maximize the exchange of gases?

Ans. The walls of the alveoli is folded and has large surface areas. It contain an extensive network of blood vessels which provide a surface where the exchange of gases can take place.

41. What would be the consequence of a deficiency of hemoglobin in our bodies?

Ans. Haemoglobin is a pigment present in RBC. It has a high affinity for oxygen. It carries oxygen from lungs to various tissues which are deficient in oxygen. Presence of less hemoglobin will result in less supply of oxygen to tissues. A person having less hemoglobin will get tired soon and will have a pale look.

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

Ans. Difference between transport in xylem and phloem:

Xylem	Phloem
a. Xylem transport minerals and water from root to leaves.	a. Phloem transport food from leaves to root and storage organs.
b. Transport is unidirectional.	b. Transport is bidirectional.
c. Xylem consists of trachieds and vessels.	c. Phloem consists of sieve tubes and companion cells.

43. Compare the functioning of alveoli in the lungs and nephron in the kidneys with respect to their structure and functioning.

Ans. Comparison between alveoli and nephron:

Alveoli	Nephron
They have thin-walled balloon-like structure. The alveoli provide a surface extensively supplied with blood capillaries for exchange of gases in lungs. Carbon dioxide released in the cavity of alveoli and oxygen is taken by hemoglobin present in RBC of blood.	Nephron is a cluster of very thin walled blood capillaries found in kidney. Each capillaries cluster remains associated with the cup-shaped end of a tube called Bowman's capsule that collects the filtered urine, at the same time the useful substance are reabsorbed.

44. Leaves of a healthy potted plant were coated with petroleum jelly. How will it affect the plant? State two reasons.

Ans. The plant will not remain healthy for long due to the following reasons:

1. There will be no transpiration.
 2. There will be no exchange of gases which will affect the rate of photosynthesis.
-

45. How does respiration in plants differ from that in animals?

Ans. In plants, all parts like the root, stem, leaves, etc., perform respiration individually., while in animals, either the general body surface or specific organs like the skin, gills, lungs, etc., are involved in respiration. The rate of respiration is much slower in plants than in animals. Unlike animals, there is little transport of gases from one part of the plant to another.

46. How does respiration in plants differ from that in animals?

Ans. The acid is formed in the mouth after a sugary food (chocolates and sweet) has been taken. This acid lowers the pH in the mouth. Tooth decay starts when the pH of acid formed in the mouth falls below 5.5. This is because then the acid becomes strong enough to attack the enamel of our teeth and corrode it.

47. Name the cartilaginous flap which closes the glottis to check the entry of food into it during swallowing.

Ans. The tissue that got blocked may be xylem. It is through the xylem that water and minerals absorbed by roots from the soil are transported to the leaves and other parts of the plant. So, if xylem is blocked, the leaves will not get the nourishment and will get wilted.

48. How does respiration in plants differ from that in animals?

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49. Write one feature which is common to each of the following pairs of the term/organs.

i) glycogen and starch

ii) chlorophyll and haemoglobin

iii) gills and lungs

iv) arteries and veins.

Ans. i) Carbohydrate (food)

ii) Pigments.

iii) Respiratory organs.

iv) Blood vessels.

50. A certain tissue in a green plant somehow get blocked and the leaves wilted. What was the tissue that got blocked?

Ans. The tissue that got blocked may be xylem. It is through the xylem that water and minerals absorbed by roots from the soil are transported to the leaves and other parts of the plant. So, if xylem is blocked, the leaves will not get the nourishment and will get wilted.

51. Write the functions of the following in the digestive process:

i. Bile

ii. Bicarbonate secreted by the duodenal wall.

iii. Pancreatic amylase.

Ans. i. Bile: It is secreted by the gall bladder and it emulsifies & it into the smaller droplets for their easy digestion.

ii. It provides alkaline medium in the duodenum which is needed for the action of pancreatic enzymes of different food components for their digestion.

iii. Pancreatic amylase enzyme digests starch and changes it into maltose.

52. The two openings of the pharynx, one leading to trachea and the other leading to oesophagus, lie very close to each other. Yet food we swallow normally does not enter into our trachea. Why?

Ans. The food does not enter into trachea because during swallowing, the aperture leading to trachea (glottis) gets covered by a cartilaginous flap called epiglottis and the food has no other passage except going into the oesophagus.

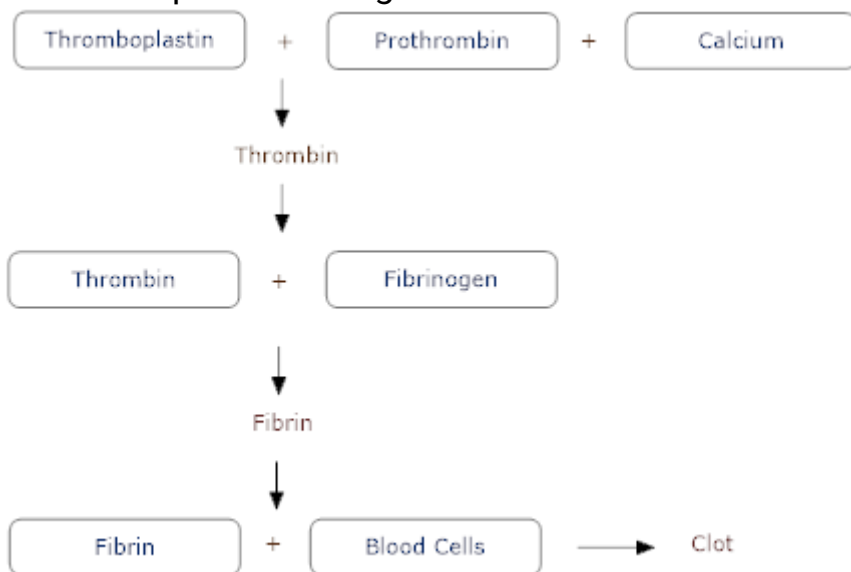
53. How would it affect the digestion of proteins and carbohydrates if the duodenum of man if there is a blockade in the pancreatic duct?

Ans. Duodenum is the region where the pancreatic juice secreted by the pancreas enters. The enzymes pancreatic amylase and trypsin helps in the digestion of carbohydrates and proteins. Thus, if there is a blockade, the digestion of carbohydrates and proteins gets affected.

5 Marks Questions

1. What is 'clotting of blood'? Write a flow chart showing major events taking place in clotting of blood?

Ans. Formation of clot at the site of injury to stop bleeding is known as 'clotting of blood'. Steps for clotting of blood –



2. With the help of a labelled diagram of human excretory system, Mention its important part and explain them.

Ans. 1) Kidney – It is the functional unit of excretory system. Each kidney is made up of about million microscopic coiled channels called nephrons. Nephrons are the basic filtration unit in the kidneys. It consists of – Glomerulus's, Bowman's capsule,

convoluted tubule.

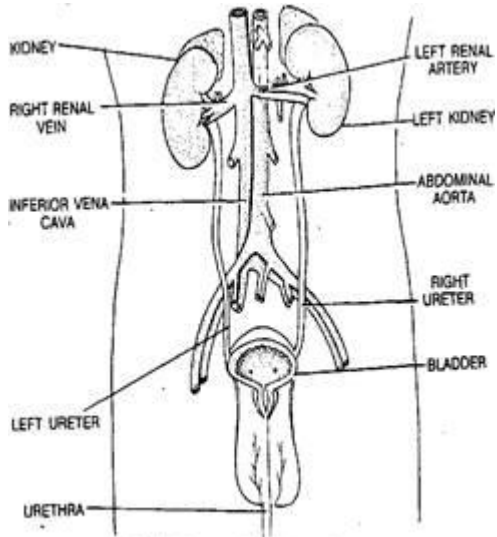


Fig. 1 : Human : Excretory system.

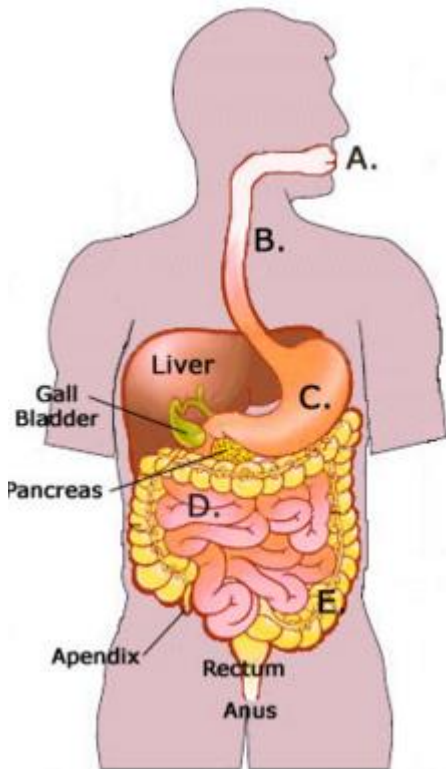
- 2) Ureter – Wastes comes out of the kidney into the ureter.
- 3) Urinary bladder – Ureter pours its contents into a muscular sac called the urinary bladder.
- 4) Urethra – Urine flows from bladder to the outside through the urethra.

3. (i) Draw a well labeled diagram of human digestive system

(ii) Describe the role of following in digestion.

- a) Bile
- b) Salivary amylase
- c) HCl

Ans. (i)



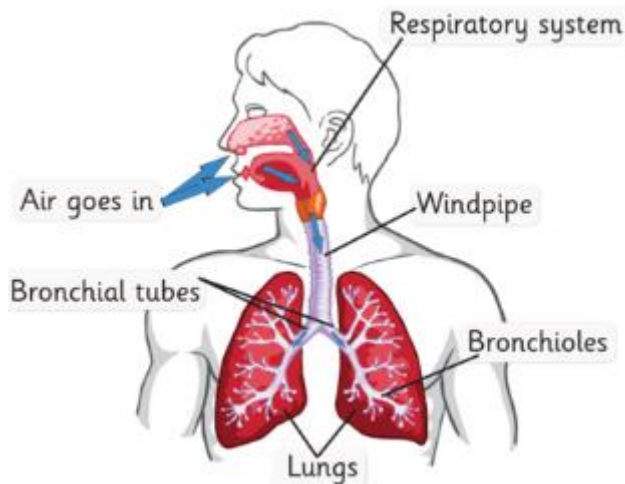
a) Bile – emulsification of fats

b) Salivary amylase – digest starch in mouth

c) HCl – Activate pepsinogen by making medium acidic in stomata.

4. With the help of labeled diagram, Discuss the mechanism of respiration in human beings.

Ans. Mechanism of Respiration – It occurs in following steps



a) Breathing – Taking in oxygen and expelling carbon – dioxide out is called breathing. It involves following steps –

(i) Inhalation – It is taking in oxygen. It occurs due to contraction of muscles attached to ribs. This lifts ribs and flatter diaphragm, which increase the volume of thoracic cavity. Hence the pressure inside the thoracic cavity decreases and air rushes inside of the lungs.

(ii) Exhalation – It is expelling of carbon – dioxide. It occurs due to relaxation of muscles attached to ribs and diaphragm is dome shaped. This decreases the volume of thoracic cavity and decreases air pressure and expels CO_2 out of the lung.

b) Exchange of gases – It takes place between the alveoli of lungs and surrounding blood capillaries.

c) Transport of gases in blood – Hemoglobin present in the blood

transport. O_2 and CO_2 in blood. Oxygen is transport from the lungs to the body cells in the form of any hemoglobin.

d) Oxidation of food – Break down of glucose molecules which produce energy. It occurs is into chondria.

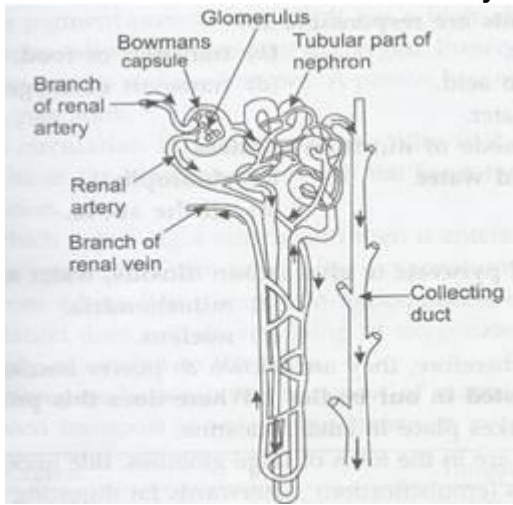
5. Describe an experiment to prove that carbon – dioxide is essential for the process of photosynthesis.

Ans. Experiment showing CO_2 is essential for photosynthesis.

- 1) Take a potted plant with elongated leaves
 - 2) Take an empty bottle and put a little amount of potassium hydroxide (KOH) in it.
 - 3) Now cut the cork of the bottle into two parts and place it on one of the leaves of the potted plant in between the two parts of the cork.
 - 4) Now put the bottle in the presence of sunlight 72 – 96 hours.
 - 5) Now test the leaf for the presence of starch.
-

6. Describe the structure and functioning of nephron.

Ans. Each nephron is a cluster of very thin-walled blood capillaries. Each capillary cluster in the kidney called glomerulus is associated with the cup shaped Bowman's capsule that collects the filtered urine. Nephron filters the blood in order to remove nitrogenous waste. They also absorb some useful substance such as glucose, amino acids, minerals and major amount of water from filtrate.



7. Describe double circulation in human beings. Why is it necessary?

Ans. In mammals and birds the blood goes through the heart twice during each cycle. This is known as double circulation.

Deoxygenated blood which enters right auricle and then it enters the right ventricle from where it is pumped to lungs for oxygenation. From lungs after oxygenation it comes to left auricle and then enters left ventricle from where it is pumped to various parts of body.

Such system of circulation does not allow mixing of oxygenated and deoxygenated blood which allows efficient supply of oxygen to the body.

HOTS

1. **While eating you are advised not to talk. Why are you advised so?**

Ans. We are advised so because while eating some food particles might enter the wind pipe which can lead to choking.

2. **We say that movement is a characteristic of living organisms but we always don't see visible movements in plants. Comment.**

Ans. We always don't see visible movements in plants. It does not mean that they are not alive. Molecular movements take place in their body.

3. **If a person is working on a treadmill in a gymnasium, will it effect his rate of breathing? How?**

Ans. Yes, it will affect his rate of breathing. The rate of breathing will become fast to supply more oxygen to meet the increased demand of energy.

4. **If you compare your rate of breathing by feeling your chest movement with the number of times a fish opens and closes its mouth. Which will be higher and why?**

Ans. The number of times a fish opens and closes its mouth will be higher as the amount of dissolved oxygen in water is fairly low compared to the amount of oxygen in the air. Therefore, rate of breathing in aquatic organisms is much faster than in terrestrial organisms.

5. **Mucus is not used for churning the food or digesting it. Then why is it secreted in the stomach?**

Ans. Mucus is secreted in the stomach to protect its inner lining from being damaged by HCl. Excessive secretion of HCl can damage the lining and lead to peptic ulcer.

6. **In the process of Photosynthesis food A is prepared which gets converted into food B. What are A and B? Why is A converted to B?**

Ans. Food A is glucose and food B is Starch.

A is converted to B as B is insoluble form of carbohydrate. It is more compact and hence, suitable for storage.

7. **When we are asleep we are not performing any activity still our life processes are going on. Why?**

Ans. "The maintenance functions of living organisms must go on even when they are not doing anything particular." That is why the life processes are going on even while we are asleep or not performing any activity.

8. **Leaves of a healthy potted plant were coated with petroleum jelly. How will it affect the plant? State two reasons.**

Ans. The plant will not remain healthy for long due to the following reasons:-

1. There will be no transpiration.
2. There will be no exchange of gases which will affect the rate of photosynthesis.

1. **Due to availability of less water, how does the plant cope up with lack of water in desert conditions?**
Ans. They open their stomata at night and stomata remain closed during day time, to conserve moisture.
2. **After a vigorous exercise, you may experience cramps in your leg muscles. Why does this happen?**
The sudden build up of lactic acid in our muscles during vigorous, exercise, causes muscular cramps in our leg muscles.
3. **What will happen if carbon monoxide combines with haemoglobin?**
Ans. If the haemoglobin binds with carbon monoxide strongly, the oxygen will not be carried with blood leading to death of the organism
4. **Food moves down the gut by peristalsis. Which region of brain controls peristalsis?**
Ans. Medulla of hind brain.
5. **Name the pigment present in plants, which can absorb solar energy.**
Ans. Chlorophyll.
6. **Name the respiratory organs of (i) fish (ii) mosquito (iii) earthworm.**
Ans. Fish - gills
7. **Which of the four chambers of the human heart has the thickest muscular walls?**
Ans. Right ventricle.
8. **What will be the outcome if a farmer floods his field everyday?**
Ans. Respiration of plants will be affected because the oxygen present in the interspaces of the soil will be replaced by water.
9. **Which part of visible spectrum is absorbed by chlorophyll pigments?**
Ans. Blue and Red light
10. **How does respiration in plants differ from that in animals?**
Ans. In plants, all parts like the root, stem, leaves, etc., perform respiration individually., while in animals, either the general body surface or specific organs like the skin, gills, lungs, etc., are involved in respiration. The rate of respiration is much slower in plants than in animals. Unlike animals, there is little transport of gases from one part of the plant to another.
11. **Name the cartilaginous flap which closes the glottis to check the entry of food into it during swallowing.**
Ans. Epiglottis
12. **Which equipment is used to facilitate breathing during serious breathing problems?**
Ans. Ventilator
13. **Chloroplast are called energy convertors. Explain.**
Ans. Chloroplasts are called energy convertors because they trap the solar energy and convert it into chemical energy.
14. **Why is the rate of breathing much faster in aquatic organism than those of terrestrial organisms?**
Ans. The aquatic organism obtain oxygen dissolved in water. As compared to air the availability of oxygen in water is fairly low. Hence, the aquatic organisms have to breathe faster as compared to the terrestrial organisms.

15. **Why are glomeruli considered as dialysis bags?**

Ans. The main function performed by the glomeruli is selective filtration. They filter small molecules containing glucose, salts, urea, and liquid serum. Etc. The large molecules such as proteins remain in blood. Thus, glomeruli of the kidneys function as dialysis bags.

16. **Autotrophs synthesise food for the living world. Justify this statement in one sentence only interconnecting autotrophs and heterotrophs.**

Ans. The food producers are autotrophs and all the heterotrophs consume the food produced by the autotrophs directly or indirectly.

17. **Veins and arteries carry blood. Which of these carry blood?**

- a. **Away from the heart?**
- b. **Back to the heart?**

Ans.

- c. Arteries carry blood away from the heart.
- d. Large intestine

18. **Which of the organs perform the following functions in humans?**

- i. **Absorption of food.**
- ii. **Absorption of water**

Ans.

- i. Absorption of food takes place in small intestine.
- ii. Large intestine

19. **Name the areas in a woody stem through which respiratory exchange of gases take place.**

Ans. In woody stem, the bark has lenticels for gaseous exchange.

20. **Tooth enamel is one of the hardest substances in our body. How does it undergo damage due to eating chocolates and sweets?**

Ans. The acid is formed in the mouth after a sugary food (chocolates and sweet) has been taken. This acid lowers the pH in the mouth. Tooth decay starts when the pH of acid formed in the mouth falls below 5.5. This is because then the acid becomes strong enough to attack the enamel of our teeth and corrode it.

21. **A certain tissue in a green plant somehow get blocked and the leaves wilted. What was the tissue that got blocked?**

Ans. The tissue that got blocked may be xylem. It is through the xylem that water and minerals absorbed by roots from the soil are transported to the leaves and other parts of the plant. So, if xylem is blocked, the leaves will not get the nourishment and will get wilted

22. **Write one feature which is common to each of the following pairs of the term/organs.**

- a. **glycogen and starch**
- b. **chlorophyll and haemoglobin**

- c. **gills and lungs**
- d. **arteries and veins.**

Ans.

- e. Carbohydrate (food)
- f. Pigments
- g. Respiratory organs.
- h. Blood vessels.

23. **Why doesn't the lungs collapse even after forceful expiration?**

Ans. Even after forceful expiration to the maximum capacity, some amount of air remains in the lungs, known as residual volume. So, the lungs doesn't collapse even after forceful expiration.

24. **The two openings of the pharynx, one leading to trachea and the other leading to oesophagus, lie very close to each other. Yet food we swallow normally does not enter into our trachea. Why?**

Ans. The food does not enter into trachea because during swallowing, the aperture leading to trachea (glottis) gets covered by a cartilaginous flap called epiglottis and the food has no other passage except going into the oesophagus.

25. **How would it affect the digestion of proteins and carbohydrates if the duodenum of man if there is a blockade in the pancreatic duct?**

Ans. Duodenum is the region where the pancreatic juice secreted by the pancreas enters. The enzymes pancreatic amylase and trypsin helps in the digestion of carbohydrates and proteins. Thus, if there is a blockade, the digestion of carbohydrates and proteins gets affected.

26. **What do you mean by double circulation of blood?**

Ans. Blood passes through the heart twice for each cycle of the body.

27. **"If there were no algae there would be no fish in the sea". Comment.**

Ans. Algae produce O₂ as result of the photosynthesis. This oxygen is utilized by the fishes in the sea for carrying out respiration. If there were no algae, no oxygen would have been produced. Thus, fishes might have died.

28. **Write the functions of the following in the digestive process:**

- i. **Bile**
- ii. **Bicarbonate secreted by the duodenal wall.**
- iii. **Pancreatic amylase.**

Ans.

- a. Bile: It is secreted by the gall bladder and it emulsifies the fats into the smaller droplets for their easy digestion.
- b. It provides alkaline medium in the duodenum which is needed for the action of pancreatic enzymes of different food components for their digestion.
- c. Pancreatic amylase enzyme digests starch and changes it into maltose.

29. **Why is the process of diffusion insufficient to meet the oxygen requirement of human beings?**

Ans. The process of diffusion for carrying O₂ to all parts of the body is not sufficient for larger multicellular organisms like human beings. Hence, respiratory pigment haemoglobin takes up oxygen from the air and carry it to all the parts of our body through blood.

30. **Draw a diagram of human alimentary canal showing duodenum, small intestine, liver and pancreas.**

31. **Draw a diagram of the human urinary system and label in it.**

- a. **Kidney**
- b. **Ureter**
- c. **Urinary Bladder**
- d. **Urethra**