Chapter 6 Life Processes

Question 1. Why is diffusion insufficient to meet the oxygen requirements of multicellular organisms like humans?
Answer: In multicellular organisms all the cells may not be in direct contact with the surrounding environment. Hence diffusion will not meet all the requirements of all the cells.

Question 2. What criteria do we use to decide whether something is alive?
Answer: Movement in response to external stimuli, breathing, growth etc.

Question 3. What are outside raw materials used for by an organism?
Answer: Outside raw materials are used for maintenance and sustenance of life by an organism.

Question 4. What processes would you consider essential for maintaining life?
Answer: All processes that perform the maintenance function of living organisms are called life processes. All life processes are essential for maintaining life.

Question 5. What are the differences between autotrophic nutrition and heterotrophic nutrition?
Answer: Autotrophic Nutrition:

- Food is made from inorganic components.
- Chlorophyll and sunlight is required.
- Photosynthesis or chemosynthesis takes place.
- It occurs in green plants and some bacteria.

Heterotrophic Nutrition:

- Food is obtained from organic components
- Chlorophyll and sunlight is not required.
- These processes do not occur.
- It occurs in animals and insectivorous plants.

Question 6. Where do plants get each of the raw materials required for photosynthesis?
Answer: For photosynthesis plants obtain the following raw materials:

1. Water: Roots absorb it from the soil.
2. Carbon dioxide: Stomata in leaves allow the carbon dioxide gas to enter into the plant.
3. Chlorophyll: It is already present in the leaves.
4. Sunlight: From the sun.

Question 7. What is the role of acid in our stomach?
Answer: Acid (HCl) present in our stomach makes the medium acidic so as to facilitate the action of the enzyme pepsin and it kills the bacteria ingested with food.

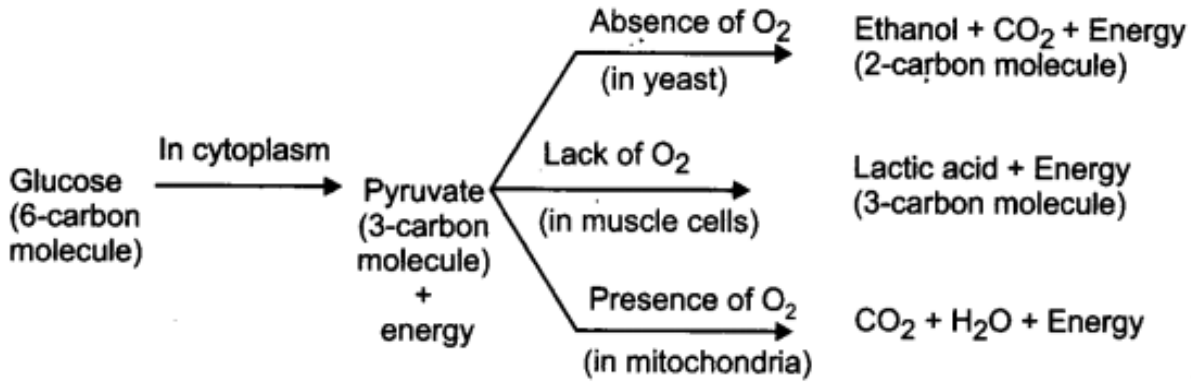
Question 8. What is the function of digestive enzymes?
Answer: Digestive enzymes act on the complex food to break them into simpler components.

Question 9. How is the small intestine designed to absorb the digested food?
Answer: Small intestine has finger-like projection in the inner lining which increases the surface area for the absorption of food. These finger-like projections are called villi. The villi are richly supplied with blood vessels which take the absorbed food to each and every cell of the body.

Question 10. What advantages over an aquatic organism does a terrestrial organism have with regard to obtaining oxygen for respiration?

Answer: Aquatic organism takes in the oxygen dissolved in water which is in less percentage than the oxygen present in air. Terrestrial organism can take in more amount of oxygen at a time than aquatic organisms.

Question 11. What are the different ways in which glucose is oxidised to provide energy in various organisms?
Answer: Breakdown of glucose by various pathways for different organisms are:



Question 12. How is oxygen and carbon dioxide transported in human beings?
Answer: Oxygen is carried by haemoglobin present in the RBC of the blood, carbon dioxide is soluble in water and hence is transported by the blood in dissolved form.

Question 13. How are lungs designed in human beings to maximise the area for exchange of gases?
Answer: In human beings lungs have the tubes called bronchioles which divide into smaller tubes and terminate into balloon-like structures called alveoli. The alveoli provide large surface area where the exchange of gases can take place.

Question 14. What are the components of transport system in human beings? What are the functions of these components?
Answer: In human beings the transport system consists of the

following:

(i) Heart: It acts as a pumping organ.

(ii) Blood: It is the transport medium. It is made up of:

- Plasma – It carries food molecules, nitrogenous wastes, salts, carbon dioxide, hormones proteins etc. in a dissolved form.
- RBC – Consists of haemoglobin and transports oxygen.
- WBC – Helps to fight infection.
- Platelets – Helps in the clotting of blood.

(iii) Blood vessels:

- Arteries – Carry oxygenated blood away from the heart to each and every cell.
- Veins – Bring de – oxygenated blood to heart for purification.

Question 15. Why is it necessary to separate oxygenated and deoxygenated blood in mammals and birds?
Answer: Mammals and birds need large amount of energy for their life processes and hence the oxygenated blood can help them to obtain this energy by breaking down the food.

Question 16. What are the components of the transport system in highly organised plants?
Answer: The components of the transport system are xylem and phloem in highly organised plants.

Question 17. How are water and minerals, transported in plants?
Answer: Water and minerals are transported in plants with the help of xylem tissue. Roots absorb the water from the soil by

actively taking up ions, creates the difference in the concentration of these ions between the root and the soil. Water enters the root cells.

The water moves up creating a column of water that is steadily pushed upwards in vessels and tracheids of the roots, stem and leaves, and are interconnected to form a continuous system of water – conducting channels reaching all parts of the plant. The water loss by leaves through stomata is called transpiration. It creates a suction pull, which pulls water from the xylem cells of roots.

Question 18. How is food transported in plants?
Answer: The transport of food in plants is called translocation. It takes place with the help of a conducting tissue called phloem. Phloem transports glucose, amino acids and other substances from leaves to root, shoot, fruits and seeds. Sieve tube and companion cells help in transporting the food in upward and downward directions.

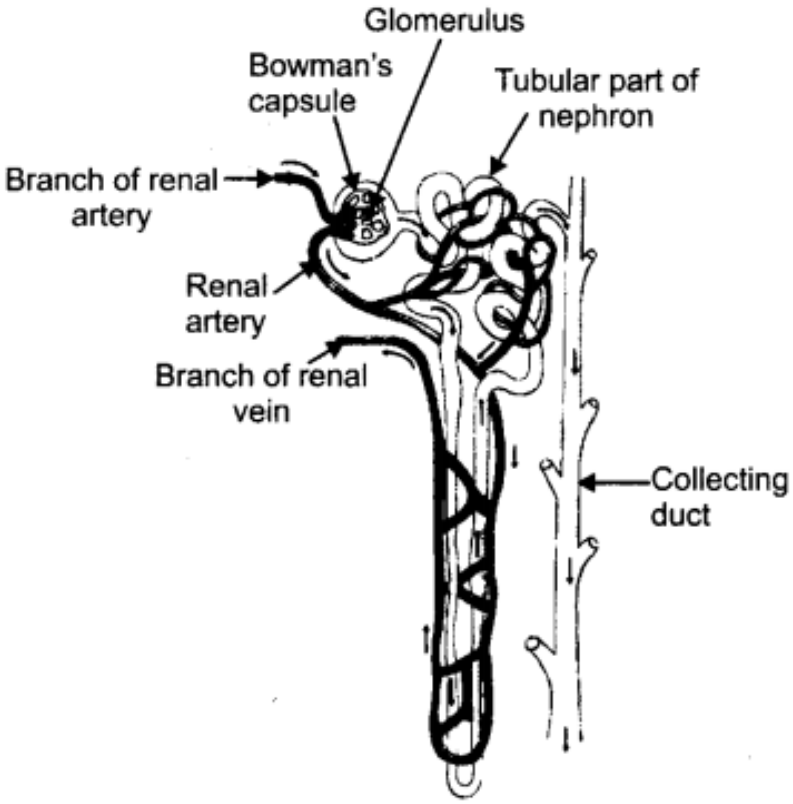
Sucrose like materials are transported using energy from ATP and osmotic pressure, which is caused due to water. This pressure moves the material in the phloem to tissues which have less pressure. This pressure helps in the movement of material in plants.

Question 19. Describe the structure and functioning of nephrons.
Answer: Structure of nephrons: It consists of a Bowman's capsule in which glomerulus is present (cluster of capillaries). The different arteries brings the impure blood to nephron. The cup shaped structure (Bowman's capsule) form a tubular part of nephron which leads to collecting duct.

Working of Nephron:
(i) Filtration: The renal artery or afferent artery is wider and slowly it becomes a narrow tube in the glomerulus. Due to difference in the width, pressure difference is caused and water

with dissolved impurities are squeezed out from the tube. It is collected in the Bowman's capsule which is cup-like structure and passes into the tube.

(ii) Reabsorbtion: The above filtrate passes through the tubule where the major amount of water, glucose, amino acids are selectively reabsorbed by the capillaries which are surrounding the tubule.



Structure of a nephron

(iii) Urine formation: The water and impurities which is not reabsorbed is sent to a collecting duct. This filtrate contains more of dissolved nitrogenous wastes i.e. urea and hence it is termed as urine. From here the urine enters the ureter and is collected in urinary bladder.

Question 20. What are the methods used by plants to get rid of excretory products?
Answer: Wastes excreted from plants are:

- Gaseous wastes – through stomata pores CO_2 is given out during respiration and O_2 is given out during photosynthesis.
- Liquid wastes (water) – through stomata pores by transpiration.
- Other wastes – are stored in leaves dead cells and the leaves fall off.

Some other waste products are stored as resins and gums in old xylem of the plant and other wastes are also thrown out from nodes into the soil.