

**Class 10 biology life processes important questions: MCQ:**

Q) Which of the following enzymes needs an acidic medium to be active

- (a) Trypsin
- (b) Pepsin
- (c) Lipase
- (d) None of the above

Solution: (b) Pepsin

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

- (a) Cytoplasm
- (b) Chloroplast
- (d) Golgi body
- (c) Mitochondria

Solution: (a) Cytoplasm

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

- (a) Glycogen
- (b) Protein
- (c) Starch
- (d) Fatty acid

Solution: (c) Starch

Q) What prevents backflow of blood inside the heart during contraction:

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

Solution: . (b) Valves in heart

Q) The energy currency of the cell is:

- (a) ATP
- (b) AMP
- (c) CO<sub>2</sub>
- (d) ADP

Solution: . (a) ATP

Q) The blood leaving the tissues becomes richer in:

- (a) Carbon-di-oxide
- (b) Water
- (c) Hemoglobin
- (d) Oxygen

Solution: (d) Oxygen

Q) Which is the first enzyme that gets mixed with food in the digestive tract?

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

Solution: (d) Amylase

Q) Complete the following reactions:



- (a) Mitochondria
- (b) Chlorophyll
- (c) Iodine
- (d) Carbon dioxide

Solution: b) Chlorophyll

Q) The opening and closing of the stomatal pore depends upon.

- (a) Temperature
- (b) Oxygen
- (c) Concentration of  $\text{CO}_2$  in stomata
- (d) Water in guard cells

Solution: (d) Water in guard cells

### **Class 10 biology life processes important questions: Assertion and Reason Questions:**

Instructions: In the following questions a statement of Assertion is followed by a statement of Reason.

Mark the correct choice as two statements are given one labeled Assertion (A) and the other labeled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below:

- (a) Both A and R are true, and R is correct explanation of the assertion.
- (b) Both A and R true, but R is not the correct explanation of the assertion.
- (c) A is true, but R is false.
- (d) A is false, but R is true.

Q) Assertion: Rate of breathing in aquatic organisms is slower than terrestrial organisms.

Reason: The amount of dissolved oxygen is fairly low as compared to amount oxygen in air.

Solution: (d) A is false, but R is true

Q) Assertion: The effect of root pressure in transport of water is more important at night.

Reason: During the day the transpiration pull acts as major driving force in the movement of water in the system.

Solution: . (b) Both A and R are true, but R is not the correct explanation of the assertion.

Q) Assertion: The opening and closing of the pore of stomata is a function of the guard cell.

Reason: The stomatal pore opens when water comes out of guard cells causing their shrinkage.

Solution: . (a) Both A and R are true, and R is the correct explanation of the assertion.

Q) Assertion: Carnivores have a shorter small intestine.

Reason: Meat is easier to digest.

Solution: . (a) Both A and R are true, and R is the correct explanation of the assertion.

Q) Assertion: Plasma of blood transports food, carbon dioxide and nitrogenous wastes.

Reason: Red blood corpuscles carry oxygen.

Solution: (b) Both A and R are true, but R is not the correct explanation of the assertion.

### **Class 10 biology life processes important questions: **Very Short Answer Questions:****

Q) Give Reasons:

(i) The number of stomata are more on the lower surface of the leaf as compared to the upper surface.

(ii) Arteries are thick walled.

(iii) Plants have low energy needs.

(iv) Aquatic animals breathe faster than the terrestrial animals.

Solution: .(i)Stomata are more numerous on the lower side of the leaf to prevent transpiration. Transpiration is the loss of water through stomata, so, more stomata are found on the lower surface to prevent excessive loss of water.

(ii) Arteries have thick walls to withstand the high pressure of blood pumped from the heart, ensuring efficient distribution of oxygenated blood to various parts of the body.

(iii) Plant have low energy requirement because they are non motile

(iv) Oxygen is less soluble in water, so aquatic animals need to breathe faster to meet their oxygen requirements.

Q) State one difference between autotrophic and heterotrophic mode of nutrition.

Solution: One difference between autotrophic and heterotrophic modes of nutrition is that autotrophic organisms can synthesize their own food using simple inorganic substances like carbon dioxide and water, whereas heterotrophic organisms rely on other organisms for their food.

Q) Define peristaltic movement.

Solution: Peristaltic movement is the involuntary constriction and relaxation of muscles in the walls of the gastrointestinal tract, which propels food and other contents through the digestive system.

Q) What stops blood from flowing backwards through the heart. (CBSE 2008)

Solution: The aortic and pulmonic valves close, preventing backward blood flow into the heart. The mitral and tricuspid valves then open to allow forward blood flow within the heart to fill the ventricles again.

Q) Name the process used by single-celled organisms for taking in food, exchange of gases or removal of wastes. (CBSE 2016)

Solution: Diffusion is the process used by single-celled organisms for taking in food, exchange of gases or removal of wastes.

Q) Name the tissue that transports water and minerals in plants.

Solution: . The tissue that transports water and minerals in plants is called xylem

Q) What is the role of acid in our stomach?

Solution: The role of acid in our stomach is to help break down food particles into smaller, more digestible components. It also helps in killing bacteria that may be present in the food.

Q) What is the role of saliva in the digestion of food?

Solution: Saliva helps in the digestion of food by moistening and lubricating food particles, which aids in swallowing. It also contains enzymes like amylase, which begins the digestion of carbohydrates in the mouth.

Q) What is emulsification?

Solution: Emulsification is the process of breaking down large fat globules into smaller droplets to increase the surface area for digestion by enzymes like lipase.

Q) Name the largest artery in the human body.

Solution: The largest artery in the human body is the aorta.

Q) Name the cell organelle in which photosynthesis occur.

Solution: The cell organelle in which photosynthesis occurs is the chloroplast.

Q) Define transpiration.

Solution: Transpiration is the process by which moisture is carried through plants from roots to small pores on the underside of leaves, where it changes to vapor and is released into the atmosphere.

Q) What is the structural and functional unit of kidney called?

Solution: The structural and functional unit of the kidney is called the nephron. It is responsible for filtering blood and producing urine.

### **Class 10 biology life processes important questions: Short Answer Questions:**

Q) Name the organ which perform the following functions in human

- (i) Absorption of digested food
- ii) Absorption of water
- iii) Secretion of Bile juice.

Solution: . i) Small intestine

ii) Large intestine

iii) Liver (Bile juice is stored in the gallbladder and released into the small intestine)

Q) Diagrammatically illustrate the process of utilization and digestion of food in Amoeba.

Solution: Amoeba exhibits holozoic nutrition, a process involving several steps:

(i). Ingestion: Food particles are engulfed by amoeba using pseudopodia, forming a food vacuole through a process called phagocytosis.

(ii). Digestion: Inside the food vacuole, enzymes break down the ingested food into smaller, soluble particles.

(iii). Absorption: Digested nutrients diffuse from the food vacuole into the cytoplasm of the amoeba.

(iv). Assimilation: The absorbed nutrients are utilized by the amoeba for energy, growth, and repair of cell structures.

(v).Egestion: Undigested material or waste is expelled from the amoeba by the rupturing of its cell membrane.

This process allows amoeba to obtain energy and nutrients from its environment and eliminate waste products, enabling it to sustain life processes.

Give two examples of animals Which perform the following types of nutrition.

- a) Saprotrophic
- b) Parasitic
- c) Holozoic

Solution: The two examples each of organisms which perform the following types of nutrition are :

- a) Saprotrophic: Fungi, Bacteria
- b) Parasitic: Tapeworm, Malaria parasite
- c) Holozoic: Human, Lion

Q) What will happen if green plants disappear from earth?

Solution: . If green plants disappear from Earth, the entire food chain would be disrupted. Since plants are primary producers, most other organisms rely on them directly or indirectly for food. Herbivores would lose their food source, leading to a decline in populations of carnivores and omnivores that depend on them.

Q) Mention three major events that occur during photosynthesis?

Solution: Three major events that occur during photosynthesis are:

- i) Absorption of light by chlorophyll
- ii) Conversion of light energy into chemical energy
- iii) Conversion of carbon dioxide and water into glucose and oxygen

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

Solution: The energy currency in living organisms is ATP (Adenosine triphosphate). ATP is produced during cellular respiration, primarily in the mitochondria of cells.

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

Solution: The process of digestion of carbohydrates, protein, fat in human body is given below:

- Carbohydrates are digested into simple sugars (glucose) by enzymes like amylase in the mouth and small intestine.
- Proteins are digested into amino acids by enzymes like pepsin in the stomach and trypsin in the small intestine.
- Fats are digested into fatty acids and glycerol by enzymes like lipase in the small intestine.

Q) Explain the three pathways of breakdown of glucose in living organisms.

Solution: .In all organisms, glucose is first converted into pyruvate. Glucose is a 6-carbon molecule, while pyruvate is a 3-carbon molecule. This step is same in all organisms and it happens in the cytoplasm. Further breakdown of pyruvate can happen in any of the following ways:

- In Yeast: In yeast, breakdown of pyruvate take place in absence of oxygen. Due to this, it is called anaerobic respiration. Pyruvate is broken down into ethanol and carbon dioxide.

- In muscle cells: During strenuous physical activity, the energy demand from muscle cells suddenly increases. This is compensated by anaerobic respiration in muscle cells. In such a situation, pyruvate is broken down into lactic acid.

- In mitochondria: In this case, breakdown of pyruvate takes place in presence of oxygen. Due to this, it is called aerobic respiration. Pyruvate is broken down into carbon dioxide and water. Aerobic respiration is found in most of the living beings.

Q) How is small intestine designed to absorb digested food?

Solution: The small intestine has millions of tiny finger-like projections called villi. These villi increase the surface area for efficient food absorption. Within these villi, many blood vessels are present that absorb the digested food and carry it to the bloodstream. The absorbed food from the bloodstream is delivered to every cell of the body

Q) Describe the process of double circulation in human beings.

Solution: Double circulation describes the fact that blood flows twice in the heart before it completes one full round. One is pulmonary circulation and the other is systemic circulation. Pulmonary circulation starts from the pulmonary artery which divides into two branches which enter the respective lungs. Pulmonary veins collect the oxygenated blood from the lungs and carry it back to the left auricle of the heart.

Systemic circulation starts with aorta that arises from the left ventricle. The aorta arches back and continues behind as aorta. The aorta sends arteries to various parts of the body and tissues. From there, blood is collected by veins and sent back to the heart.

Q) Define the term transpiration. Design an experiment to demonstrate transpiration.

Solution: Transpiration is defined as the evaporation of excess water from the stomata present in the leaves of plants.

Experiment to show transpiration process:

Procedure:

(i) Take a healthy potted plant and cover the pot with the help of rubber sheet.

Aerial parts remain uncovered

(ii) Keep the plant on glass plate and cover it with a bell jar.

(iii) Apply Vaseline at the base of bell jar to prevent outer air coming inside.

(iv) Keep the whole apparatus in light and observe for sometime.

Observation : Water drops appear inside the bell jar

Result : Transpiration occurs from potted plant.

## **Class 10 biology life processes important questions: Long Answer Questions:**

Q) (i) Write three types of blood vessels. Give one important feature of each (CBSE, Delhi 2018-19)

ii) How are CO<sub>2</sub> and O<sub>2</sub> transported in human beings? (CBSE 2018-19)

Solution: (i). Blood vessels are an essential part of the circulatory system, responsible for carrying blood throughout the body. They are classified into three types: arteries, veins, and capillaries.

Arteries are vessels that carry oxygen-rich blood from the heart to the body's tissues. They branch into smaller arterioles as they extend away from the heart.

Veins, on the other hand, carry blood back to the heart from the body's tissues. Veins are larger in size near the heart. The superior vena cava transports blood from the head and arms to the heart, while the inferior vena cava carries blood from the abdominal region and legs to the heart.

Capillaries are tiny blood vessels that connect arteries and veins. They have thin walls, allowing for the exchange of oxygen, nutrients, carbon dioxide, and other waste products between the blood and cells.

(ii). Inhaled air is rich in oxygen and is carried to the lungs. The diffusion of oxygen to the blood occurs in the capillaries, in alveoli, where the oxygen combines with the hemoglobin to form oxyhemoglobin. This oxygen-rich blood is taken to the heart, for distribution, via the pulmonary vein. The carbon dioxide moves from the tissues to the plasma and red blood cells which are carried to capillaries in alveoli via the pulmonary artery. Carbon dioxide diffuses out from the capillaries in alveoli. The carbon dioxide rich air is at last expelled from the body during exhalation while breathing.

Q) Write the function of the following in the human alimentary canal. (CBSE 2018-19)

(i) Saliva

ii) HCl in Stomach

iii) Bile juice

iv) Villi



Solution: The Function of the following in the human alimentary canal are:

i) Saliva: An enzyme in saliva called amylase begins to break down into maltose sugar.

(ii) HCl in the stomach: The main function of hydrochloric acid in food is to kill bacteria that may enter the stomach with food. It also helps in creating the acidic environment or acidic pH required for the activation of inactive pepsinogen.

(iii) Bile juice: It performs two major functions: It makes the acidic food coming from the stomach alkaline so that the pancreatic enzymes can act on it. Also, the bile salts break down the fats present in the food into small globules making it easy for the enzymes to act and digest them.

(iv) Villi: Absorption of digested food occurs mainly in the small intestine because it consists of many finger-like projections called villi that are supplied with numerous blood vessels. They provide a large surface area for the absorption of food.

Q) Write one function of each of the following enzymes.

i) Pepsin

ii) Lipase

Solution: The Function of the following enzymes are:

(i) Pepsin: Pepsin helps in the digestion of proteins into amino acids

(ii) Lipase: It is an enzyme that acts on emulsified fats (lipids) into digestible form.

Q) Draw a well labelled diagram of Nephron. Explain the process of formation of urine in the human kidney.

Solution: The process of urine formation in the kidneys, which is a crucial part of the excretory system, involves three main steps:

- Glomerular Filtration: This is the initial stage where blood enters the kidney's nephrons, and the glomerulus filters out waste products, ions, and water from the blood. This filtered fluid is known as the glomerular filtrate. Importantly, substances like red blood cells and proteins are not filtered out due to their large size.

- Tubular Reabsorption: As the glomerular filtrate moves through the renal tubules, essential substances such as glucose, amino acids, and most of the filtered water are reabsorbed back into the bloodstream. This reabsorption occurs mainly in the proximal convoluted tubule and the loop of Henle. The reabsorption of water is crucial for maintaining the body's water balance.

•Tubular Secretion: In this step, certain substances, such as hydrogen ions, potassium ions, and certain drugs, are actively secreted from the bloodstream into the renal tubules. This process helps in the elimination of excess ions and substances that were not filtered out initially.

After these processes, the remaining fluid, now called urine, flows through the collecting ducts and into the renal pelvis, eventually being excreted from the body through the ureters, bladder, and urethra.

These steps ensure that the body maintains proper fluid balance, electrolyte levels, and eliminates waste products effectively

Q) Why is energy needs in plants is very less as compared to animals? Explain.

Solution: Animals require more energy than plants. This is due to various reasons. Some are :

- i) Animals are motile organisms whereas plants are non-motile. Being motile requires more energy.
- ii) Plants have many dead tissues whereas this is not in the case of animals. Hence, again animals need more energy.

Plants being sessile stay at one place and lack the basic process of locomotion while animals move from one place to another in search of food, shelter and mates. The physical activity performed by the plants is also less when compared to animals.

### **Class 10 biology life processes important questions: Case based Question:**

There is a progressive change in the structure of the heart among vertebrates, from fishes to birds and mammals. Fish have a simple two-chambered heart. Amphibians possess a three-chambered heart with two atria and a single ventricle. Reptiles have a septum (wall) that partly divides the ventricle. Birds and mammals have a four-chambered heart.

1. In fishes blood flows from heart to gills to body and back to heart. This is example of

- (a) Single circulation
- (b) Double circulation
- (c) Both (a) and (b)
- (d) None of the above

2. Which of the following organisms shows mixing of oxygenated and deoxygenated blood-

- (a) Pigeon.
- (b) Dog
- (c) Frog
- (d) Crocodile

3. Birds and mammals have four-chambered hearts as it leads to separation of oxygenated and deoxygenated blood such a separation allows

- (a) Highly efficient supply of oxygen to the body
- (b) Give energy to maintain their body temperature continuously
- (c) Double circulation being carried on efficiently
- (d) Efficient of collection of blood from tissues of the body

Now choose the right option-

- (a) (i) & (iv)
- (b) (ii) & (iii)
- (c) (i) & (iii)
- (d) (i), (ii) & (iii)

4. In which of the following vertebrate group/groups heart does not pump oxygenated blood to different parts of the body-

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

5. Which chamber of human heart receives deoxygenated blood from tissues of the body.

- (a) Left atrium
- (b) Right atrium
- (c) Left ventricle
- (d) Right ventricle

Solution: 1. (a) Single circulation

2. (c) Frog

3. (d) Efficient of collection of blood from tissues of the body

4. (d) Pisces only

5. (b) Right atrium