Chapter - 5 Life Processes

MULTIPLE CHOICE QUESTIONS

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

(a) cytoplasm.

(b) mitochondria.

(c) chloroplast.

(d) nucleus.

2. In which of the following groups of organisms, food materials are broken down outside the body and absorbed?

(a) Mushroom, green plants, Amoeba

(b) Yeast, mushroom, bread mould

(c) Paramecium, Amoeba, Cuscuta

(d) Cuscuta, lice, tapeworm

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

(a) They synthesise carbohydrates from carbon dioxide and water in the presence of sunlight and chlorophyll

(b) They store carbohydrates in the form of starch

(c) They convert carbon dioxide and water into carbohydrates in the absence of sunlight

(d) They constitute the first trophic level in food chains

4. The opening and closing of the stomatal pore depends upon

(a) Oxygen

(b) Temperature

(c) water in the guard cells

(d) concentration of CO2

5. Choose the correct path of urine in our body

(a) kidney →ureter →urethra →urinary bladder

(b) kidney →urinary bladder →urethra →ureter

(c) kidney →ureters →urinary bladder →urethra

(d) urinary bladder →kidney →ureter →urethra

6. Which of the equations show correct conversion of CO2 and H2O into carbohydrates in plants ?

(a)

$$6CO_2 + 6H_2O \xrightarrow[\text{Heat energy}]{\text{Chlorophyll}} C_6H_{12}O_6 + 6O_2 + 12H_2O$$

(Glucose)

(b)

$$6CO_2 + 6H_2O \xrightarrow[\text{Sunlight}]{\text{Chlorophyll}} C_6H_{12}O_6 + 6O_2 + 12H_2O$$

(Glucose)

(c)

$$6CO_2 + 12H_2O \xrightarrow[\text{Sunlight}]{\text{Chlorophyll}} C_6H_{12}O_6 + 6O_2 + 6H_2O$$

(Glucose)

(d)

$$6CO_2 + 12H_2O \xrightarrow[\text{Heat energy}]{\text{Chlorophyll}} C_6H_{12}O_6 + 6O_2 + 6H_2O$$

(Glucose)

7. In normal expiration, the diaphragm is

(a) Arched

(b) Flattened

(c) Perforated

(d) None of these

8. How is food transported from phloem to the tissues according to plants' needs ?

(a) food is transported along with the water in the plant's body.

(b)food is transported in only one direction like water in the plant body through xylem.

(c) food is transported from a region with low concentration to higher concentration.

(d)food is transported from a region where it is produced to other parts of the plants.

9. The correct pathway of blood in circulatory system is

(a) atria → ventricles → arteries → veins

(b) ventricles → atria → veins → arteries

(c) ventricles → veins → arteries → atria

(d) veins → ventricles → atria → arteries

10. Which of the following events in the mouth cavity will be affected if salivary amylase is lacking in the saliva ?

(a) Starch breaking down into sugars.

(b)Proteins breaking down into amino acids.

(c) Absorption of vitamins.

(d)Fats breaking down into fatty acids and glycerol.

11. Full form of ATP ?

(a) Adenosine Triphosphate

(b) Adenosine Tetraphosphate

(c) Adenine Triphosphate

(d) Adinosine Tripolymer

12. Name the substances whose build up in the muscles during vigorous physical exercise may cause cramps ?

(a) Ethanol + Carbon dioxide + Energy

(b) Lactic acid + Energy

(c) Carbon dioxide + Water + Energy

(d) Pyruvate

13. Why blood is red ?

(a) due to presence of oxygen

(b) due to presence of haemoglobin

(c) due to presence of CO2

(d) due to presence of WBC

14. Single circulation, i.e., blood flows through the heart only once during one cycle of passage through the body, is exhibited by which of the following :

(a) hyla, rana, draco

(b) whale, dolphin, turtle

(c) labeo, chameleon, salamander

(d) hippocampus, exocoetus, anabas

15. The autotrophic mode of nutrition requires

(a) carbon dioxide and water.

(b) chlorophyll.

(c) sunlight.

(d) all of the above

16. Identify the correct path of urine in the human body.

(a) Kidney → urinary bladder → urethra → ureter

(b) Urinary bladder → ureter → kidney → urethra

(c) Kidney → ureter → urethra → urinary bladder

(d) Kidney → ureter → urinary bladder → urethra

17. Chyme is _____.

(a) Digestive enzyme secreted by stomach.

(b) Hormone secreted by islets of Pancreas

(c) food which enters into the intestine from the stomach.

(d) Part of bile juice which stores in gall bladder

18. Water absorption in plants 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

19. Which is the correct sequence of parts in the human alimentary canal ?

(a) Mouth →stomach →small intestine →oesophagus →large intestine

(b) Mouth →oesophagus →stomach →large intestine →small intestine

(c) Mouth →stomach →oesophagus →small intestine →large intestine

(d) Mouth →oesophagus →stomach →small intestine →large intestine

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

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

ANSWER KEY

S No	MULTIPLE CHOICE QUESTIONS
1	B
2	B
3	C
4	C
5	B
6	C
7	A
8	D
9	A
10	A

11	A
12	B
13	B
14	D
15	D
16	D
17	C
18	C
19	D
20	B

ASSERTION AND REASON QUESTIONS

Following questions consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

(a) Both A and R are true and R is the correct explanation of A.

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

(c) A is true but R is false.

(d) A is false but R is true.

1. Assertion (A): Diffusion does not meet high energy requirements of multi-cellular organisms

Reason (R): Diffusion is a fast process but occurs at the surface of the body.

2. Assertion (A): Kidneys perform a dual function in our body.

Reason (R): Selective reabsorption occurs in the glomerulus.

3. Assertion (A): Mammals has double circulation.

Reason: Higher energy need due to endothermy (warm blooded).

4. Assertion (A): The purpose of making urine is to filter out undigested food from intestine

Reason (R): Kidneys filter the waste and produce urine

5. Assertion (A): Arteries always carry oxygenated blood.

Reason (R): Arteries transport blood from the heart to different parts of the body.

6. Assertion (A): The inner lining of the small intestine has numerous finger-like projections called villi.

Reason (R) : The villi increase the surface area for absorption.

7. Assertion (A) : Photosynthesis takes place in green parts of the plants.

Reason (R) : Photosynthesis always takes place in leaves.

8. Assertion (A) : Ureters are the tubes which carry urine from kidneys to the bladder.

Reason (R): Urine is stored in the urethra.

9. Assertion (A): Tracheal cartilage is present in the throat.

Reason (R): The larynx plays an important role in human speech.

10. Assertion (A): During transpiration the evaporating water carries away heat energy.

Reason (R): Due to water loss the osmotic pressure inside leaves increases.

11. Assertion (A): In a healthy adult, the initial filtrate in the kidneys is about 180 L daily, but the actual volume excreted is only a litre a day.

Reason (R): Most of the filtrate is lost from the body in the form of sweat.

ANSWER KEY

S No	ASSERTION AND REASON QUESTIONS
1	C
2	C
3	A
4	D
5	A
6	A
7	C
8	C
9	B
10	C
11	C

CASE STUDY QUESTIONS

1. There is a range of strategies by which the food is taken in and used by the organisms in heterotrophic nutrition. Some organism breakdown the food material outside the body and then absorb it. Others take in whole material and break it down inside their bodies. What can be taken in and broken down depends on the body design and functioning. Some others derive nutrition from plants and animals without killing them.

1. **Organisms which derive nutrition from plants and animals without killing them.**

1. Parasites
2. Saprophytes
3. Heterotrophs
4. Autotrophs

2. In which part of amoeba complex food particles are broken down into simpler ones.

1. Cytoplasm
2. Pseudopodia
3. Nucleus
4. Food vacuole

3. Which of the following is an example of saprotroph.

1. Cuscuta
2. Sugarcane
3. Bread mould
4. Amoeba

4. Taking in whole material and breaking it down inside the body is

1. Parasitic nutrition
2. Holozoic nutrition
3. Saprophytic nutrition
4. Symbiosis

5. Heterotrophic nutrition involves

1. Production of simple sugar from inorganic compounds
2. Utilisation of chemical energy to prepare food
3. Utilisation of energy obtained by plants
4. All of these

2. Rishi experienced muscular cramps during the training session for his upcoming football match. Mr. Sen, his coach advised him on a schedule of some aerobic exercises to overcome his problem of muscular cramps. Rishi followed his coach's advice and did not face the problem of muscular cramps again during his match.

1. Which life process is depicted by the above passage ?

(a) Respiration

(b) Digestion

(c) Nutrition

(d) Excretion

2. Lack of oxygen in muscles often leads to cramps due to

(a) Conversion of pyruvate to ethanol

(b) Conversion of glucose to pyruvate

(c) Conversion of pyruvate to glucose

(d) Conversion of pyruvate to lactic acid

3. Lactic acid is produced by _____ respiration in yeast.

(a) aerobic

(b) anaerobic

(c) oxidative

(d) none of these

4. Why there is an increase in lactic acid concentration in the blood at the beginning of the exercise?

(a) Lack of oxygen

(b) Excess of oxygen

(c) Lack of carbon dioxide

(d) Excess of carbon dioxide

5. What else can be done for quick relief from muscular cramps ?

(a) Massage

(b) by applying heating pad or an ice pack

(c) painkillers

(d) all of these

3. Blood transport food and waste materials in our bodies. It consists of plasma as a fuid medium. A pumping organ is required to push the blood around.The blood fows through the chambers of the organ in a specific manner and direction. While flowing throughout the body, blood exert a pressure against the wall or a vessel.

1. Which life process is depicted by the above passage?

(a) Respiration

(b) Digestion

(c) Transportation

(d) Excretion

2. Name the blood pumping organ.

(a) Lungs

(b) Heart

(c) Kidney

(d) Liver

3. Oxygenated blood from lungs enters the left atrium through _____ .

(a) Vena cava

(b) Pulmonary artery

(c) Pulmonary vein

(d) Aorta

4. Deoxygenated blood leaves through the right ventricle through _____ .

(a) Vena cava

(b) Pulmonary artery

(c) Pulmonary vein

(d) Aorta

5. Which of the following statements is true about the heart?

(i) It is a hollow muscular organ.

(ii) It is a four chambered having three atria and one ventricle.

(iii) It has different chambers to prevent the oxygen - rich blood from mixing with the blood containing carbon dioxide.

(iv) Arteries always carry blood away from the heart.

(a) (i) and (ii)

(b) (ii) and (iii)

(c) (i), (ii) and (iii)

(d) (i), (iii) and (iv)

4. Amoeba is an animal having no fixed shape ingests food particles by formation of temporary finger-like projections. The food vacoule inside amoeba breaks down the food into small and soluble molecules. The digested food is thrown out by the amoeba by the rupture of cell membrane and it goes on for the search of next food particle.

1. Which type of organism is Amoeba ?

(a) Unicellular

(b) Microscopic

(c) Multicellular

(d) Both a and b

2. What are the temporary projections made in amoeba called ?

(a) walking legs

(b) limbs

(c) Pseudopodia

(d) None of the above

3. What type of nutrition is followed by amoeba ?

(a) Parasitic

(b) Holozoic

(c) Saprotrophic

(d) Autotrophic

4. The process of throwing out of undigested food in Amoeba is called ?

(a) Egestion

(b) Digestion

(c) Nutrition

(d) None of the above

5. Give an example of an organism which follows the same mode of nutrition in amoeba.

(a) Vertebrates

(b) Fungi

(c) Tapeworm

(d) Cuscata plants

5. Our body needs to remove the wastes that build up from cell activities and from digestion. If these wastes are not removed, then our cells can stop working and we can get very sick. The organs of excretory system consist of a pair of kidneys, a pair of ureters, a urinary bladder and a urethra. Each kidney is made up of nearly one million complex tubular structures called nephrons. The formation of urine involves various processes thattake place in the different parts of the nephrons. Each nephron consists of a cup- shaped upper end called Bowman's capsule containing a bunch of capillaries called glomerulus. Bowman's capsule leads to tubular structure, proximal convoluted tubule, loop of Henle and distal convoluted tubule which ultimately join the collecting tubule.

1. The following substances are the excretory products in animals. Choose the least toxic form.

1. Urea
2. Uric acid
3. Ammonia
4. All of these

2. Glomerular filtrate is first collected by

1. Distal convoluted tubule
2. proximal convoluted tubule
3. Bowman's capsule space
4. loop of Henle

3. The outline of principal events of urination is given below in random order.

I) stretch receptors on the wall of urinary bladder send signals to the CNS.

II) The bladder fills with urine and become distended.

III) Micturition (voiding out urine)

IV) CNS passes on motor messages to initiate the contraction of smooth muscles of bladder and simultaneous relaxation of urethral sphincter.

The correct sequence of the events is

1. I → II → III→ IV
2. IV → III → II→ I
3. II → I→ IV → III
4. III → II→ I→ IV

4. Urine formation occurs through

1. Ultrafiltration, reabsorption, secretion.
2. Secretion, osmosis, ultrafiltration and reabsorption.

3. Only filtration and absorption.
4. Only osmosis and secretion.

ANSWER KEY

S No	CASE STUDY QUESTIONS
	QUE 1
1	A
2	D
3	C
4	B
5	C
	QUE 2
1	A
2	D
3	B
4	A
5	D
	QUE 3
1	C
2	B
3	C
4	B
5	D
	QUE 4
1	D
2	C

3	B
4	A
5	A
	QUE 5
1	A
2	C
3	C
4	A

VERY SHORT ANSWER QUESTIONS

1. Name one accessory pigment and one essential pigment in photosynthetic plants.

Ans. Accessory pigment – Carotene/Xanthophyll

Essential pigment – Chlorophyll

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. Name the intermediate and the end products of glucose breakdown in aerobic respiration.

Ans. Glucose —> Pyruvate — In presence of O2—> 6CO2 + 6H2O +38 ATP

4. What is villi? What are its functions?

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

5. (i) Write the balanced chemical equation for the process of photosynthesis,

(ii) When do the desert plants take up carbon dioxide and perform photosynthesis ?

Ans.(i) Photosynthesis can be represented using a chemical equation. The overall balanced equation is

6CO2 + 12H2O — Sunlight & Chlorophyll —> C6H12O6 + 6H2O + 6O2

(ii) Desert plants open up their stomata during night and take in CO2. Stomata remains close during the day time to prevent the loss of water by i transpiration. They store the CO2 in their cells until the sun comes out and they can carry on with photosynthesis during the day time.

6. **Give one reason why multicellular organisms require special organs for exchange of gases between their body and their environment.**

Ans. In unicellular organisms the entire body of the organism is in contact with the environment\ hence exchange of materials can take place but, in multicellular organisms the entire body of the organism is not in contact with the environment and hence simple diffusion is not helpful.

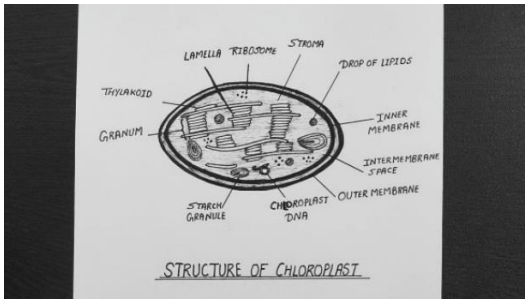
7. State two differences between arteries and veins.

Ans. Arteries: Arteries carry oxygenated blood away from the heart except pulmonary artery. These are thick-walled, highly muscular except arteries of cranium and vertebral column. Valves are absent. Blood in arteries moves with pressure.

Veins: Veins carry deoxygenated blood, towards the heart except pulmonary veins. These are thin-walled. Valves are present which provide unidirectional flow of blood. Blood in veins moves under very low pressure.

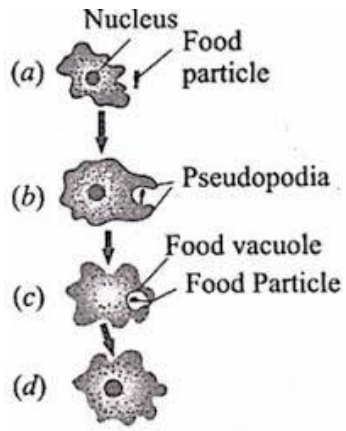
SHORT ANSWER QUESTIONS

1. Draw a neat labelled diagram of the structure of a chloroplast.

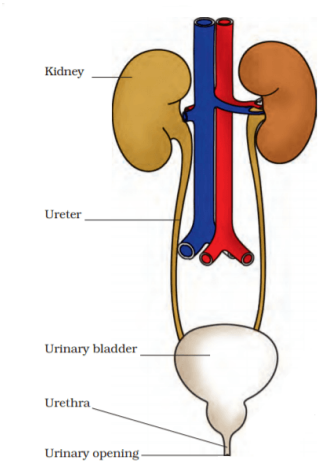


2. Explain the process of nutrition in Amoeba.

Answer: Amoeba ingests food particles with the help of its pseudopodia. The ingested food particle or phagosome fuses with lysosome to form food vacuole. The digested food passes out of the vacuole into cytoplasm. The undigested matter is thrown out.



3. Draw a diagram of human urinary system



4. (a) "The breathing cycle is rhythmic whereas exchange of gases is a continuous process". Justify this statement.

(b) What happens if the conducting tubes of the circulatory system develop a leak? State in brief, how could this be avoided?

c) How does the opening and closing of stomata take place?

Answer: (a) The breathing cycle involves inhalation and exhalation of air due to alternate expansion and contraction of thoracic cavity. Thus it is a rhythmic process. But exchange of gases is a continuous process as it takes place between the blood and each and every cell, by diffusion.

(b)The circulatory system will become inefficient if it develops a leak. This could be avoided by maintaining a normal blood pressure.

(c) When water flows into the guard cells, the guard cells swell and the stomatal pore opens up. When water moves out the guard cells shrinks and the stomatal pore closes.

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

Answer: Fish – gills, Mosquito – Trachea (air tubes), Earthworm – moist skin

LONG ANSWER QUESTIONS

1. State the role of the following in human digestive system :

(I) Digestive enzymes (II) Hydrochloric acid (III) villi

Answer: Digestive enzymes – Foods need to be broken into their small or simpler molecules so that they can be absorbed into the bloodstream. However, the physical breakdown of food is not enough. Enzymes are hence needed for the chemical breakdown of food and speeding up the digestive process. The products of digestion can hence be small enough to be absorbed.

Hydrochloric acid – Hydro chloric acid helps to kill the germs which might have entered in to the system through food. It creates acidic medium for the pepsin to act on food to breakdown proteins.

Villi – Villi are finger like projections in the small intestine. They help to increase the surface area for absorption of the digested food. Villi are richly supplied with blood vessel which help to absorb digested food in to the blood stream.

2. List the three steps in photosynthesis.

Answer: (i) Absorption of sun's energy by Chlorophyll

(ii)Conversion of light energy into chemical energy; and, splitting of water into hydrogen and oxygen using the light energy.

(iii) Reduction of carbon dioxide into carbohydrates like glucose using the chemical energy.

3. What is the significance of Small Intestine in our body ? (Any 3 points)

Answer: Significance of SI:

(i) The secretions of liver and pancreas are brought to the duodenum of SI. The hepatic duct from liver and the pancreatic

duct from pancreas join forming hepato- pancreatic duct bring the secretions of both glands to duodenum where these help in digestion of food.

(ii)There are some intestinal glands also in the first part of SI, which also secrete enzymes. The process of digestion of food is completed here.

(iii) The fine finger-like structures called “Intestinal Villi” increase the surface area for absorption of digestive end products.

(iv) The length of the SI ensures that food remains in it for a long time as it travels through SI, thereby making it possible for maximum amount of nutrients to be absorbed.

4. (a) Explain how does the exchange of gases occur in plants across the surface of stems, roots and leaves.

(b) How are water and minerals transported in plants?

Answer. (a) In plants, there are tiny pores called stomata on leaves and lenticels in stem which facilitate the exchange of gases. CO2 is taken in and O2 given out (during photosynthesis) and vice- versa during respiration.

(b) Mechanism of Transport of Water and Minerals in a Plant

The vessels and tracheids of roots, stems and leaves in xylem tissue are interconnected to form a continuous system of water-conducting channels reaching all parts of theplant. The cells of the roots in contact with the soil actively take up ions which creates a difference in the ion concentration between the root and the soil.Thus, there is steady movement of water into root xylem from the soil, creating a column of water that is pushed upwards. Plant uses another strategy to move water in the xylem upwards to the highest points of the plant body. The water which is lost through the stomata is replaced by water from the xylem vessels in the leaf. Evaporation of water molecules from the cells of a leaf creates a suction which pulls water from the xylem cells of roots.

This loss of water is transpiration which helps in the absorption and upward movement of water and minerals dissolved in it from roots to the leaves. Transpiration becomes the major driving force in movement of water in the xylem during the day when the stomata are open. This mechanism is also known as cohesion of water theory or transpiration pull.

5. List any 3 functions of the major circulatory fluid of our body.

Answer: (i) Transport of O2 (from lungs to different parts of the body) and CO2 (from tissues/ organs, back to lungs).

(ii)Transport of digested food (glucose, amino acids, etc.) from Small Intestine to various parts of the body.

(iii) Transport hormones from their site of production (endocrine organs) to the site of action (target organs or tissues in different parts of the body).

(iv) Carry nitrogenous wastes of metabolism from various tissues/ organs, to kidneys, to be removed as urine.

(v)Harmful substances or toxins are transported to the liver for detoxification.

(vi) Antibodies produced by the leucocytes provide immunity to the body.

(vii)Help maintain body temperature (thermoregulation) by the process of sweating (perspiration)