

# Life Process

## Multiple Choice Questions

### **Question 1.**

Which of the following statements about the autotrophs is incorrect?

- A. They synthesize 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

### **Answer:**

Those organisms which can make their own food from inorganic substances like carbon dioxide and water in the presence of sunlight, are called autotrophs. All green plants are the example of autotrophs.

### **Question 2.**

In which of the following groups of organisms, food material is 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

### **Answer:**

Saprophytes obtain their food from dead and decaying organisms by secreting hydrolytic enzymes over food. Examples: Yeast, mushroom,

bread mould.

**Question 3.**

Select the correct statement

- A. Heterotrophs do not synthesise their own food
- B. Heterotrophs utilise solar energy for photosynthesis
- C. Heterotrophs synthesise their own food
- D. Heterotrophs are capable of converting carbon dioxide and water into carbohydrates

**Answer:**

Those organisms which cannot make their own food from inorganic substances like carbon dioxide and water and depend on other organisms for their food are called heterotrophs. All the animals, fungi, and bacteria are examples of heterotrophs.

**Question 4.**

Which is the correct sequence of parts in 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

**Answer:**

The various organs of the human digestive system in sequence are: Mouth, Oesophagus, Stomach, Small intestine and Large intestine.

**Question 5.**

If salivary amylase is lacking in the saliva, which of the following events in the mouth cavity will be affected?

- A. Proteins breaking down into amino acids
- B. Starch breaking down into sugars
- C. Fats breaking down into fatty acids and glycerol
- D. Absorption of vitamins

**Answer:**

In the mouth, salivary glands secrete saliva. Saliva is a watery fluid which contains an enzyme called salivary amylase which partially digests the starch and converts it into maltose sugar.

**Question 6.**

The inner lining of stomach is protected by one of the following from hydrochloric acid. Choose the correct one

- A. Pepsin
- B. Mucus
- C. Salivary amylase
- D. Bile

**Answer:**

The mucus helps to protect the stomach wall from its own secretions of hydrochloric acid.

**Question 7.**

Which part of alimentary canal receives bile from the liver?

- A. Stomach
- B. Small intestine
- C. Large intestine
- D. Oesophagus

**Answer:**

In humans, small intestine is the site of complete digestion of food like carbohydrates, proteins and fats. It receives the secretions of two glands, liver and pancreas through a common duct.

**Question 8.**

A few drops of iodine solution were added to rice water. The solution turned blue-black in colour. This indicates that rice water contains

- A. Complex proteins
- B. Simple proteins
- C. Fats
- D. Starch

**Answer:**

A few drops of iodine solution were added to rice water. The solution turned blue-black in colour. This indicates that rice water contains starch because iodine turns blue-black on reacting with starch.

**Question 9.**

In which part of the alimentary canal food is finally digested?

- A. Stomach
- B. Mouth cavity
- C. Small intestine
- D. Large intestine

**Answer:**

In humans, small intestine is the site of complete digestion of food like carbohydrates, proteins and fats. It receives the secretions of two glands, liver and pancreas through a common duct.

**Question 10.**

Choose the function of the pancreatic juice from the following

- A. Trypsin digests proteins and lipase carbohydrates
- B. Trypsin digests emulsified fats and lipase proteins
- C. Trypsin and lipase digest fats
- D. Trypsin digests proteins and lipase emulsified fats

**Answer:**

Pancreas secretes pancreatic juice which contains trypsin, lipase and pancreatic amylase. Trypsin digests the proteins, lipase emulsifies the fats and pancreatic amylase breaks down the starch.

**Question 11.**

When air is blown from mouth into a test-tube containing lime water, the lime water

turned milky due to the presence of

- A. Oxygen
- B. Carbon dioxide
- C. Nitrogen
- D. Water vapour

**Answer:**

When air is blown from mouth into a test-tube containing lime water, the lime water turns milky due to the presence of carbon dioxide.

**Question 12.**

Which of the following is most appropriate for aerobic respiration?

- A. Glucose (in mitochondria) → Pyruvate (in cytoplasm) →  $\text{CO}_2 + \text{H}_2\text{O} + \text{Energy}$
- B. Glucose (in cytoplasm) → Pyruvate (in mitochondria) →  $\text{CO}_2 + \text{H}_2\text{O} + \text{Energy}$
- C. Glucose (in cytoplasm) → Pyruvate + Energy(in mitochondria) →  $\text{CO}_2 + \text{H}_2\text{O}$
- D. Glucose (in cytoplasm) → Pyruvate + Energy(in mitochondria) →  $\text{CO}_2 + \text{H}_2\text{O} + \text{Energy}$

**Answer:**

In the absence of oxygen, a six- carbon molecule, glucose break-down into three carbon molecule called pyruvate. This process takes place in the cytoplasm. Further, pyruvate may be converted into carbon dioxide and water in the presence of oxygen. This process takes place in the mitochondria.

**Question 13.**

Which of the following statement(s) is (are) true about respiration?

1. During inhalation, ribs move inward and diaphragm is raised
  2. In the alveoli, exchange of gases takes place i.e., oxygen from alveolar air diffuses into blood and carbon dioxide from blood into alveolar air
  3. Haemoglobin has greater affinity for carbon dioxide than oxygen
  4. Alveoli increase surface area for exchange of gases
- A. (1) and (4)
- B. (2) and (3)
- C. (1) and (3)
- D. (2) and (4)

**Answer:**

The tiny air-sacs at the end of the smallest bronchioles are known as Alveoli. Alveoli provides a large surface area for the exchange of gases.

**Question 14.**

Which is the correct sequence of air passage during inhalation?

- A. Nostrils → larynx → pharynx → trachea → lungs
- B. Nasal passage → trachea → pharynx → larynx → alveoli
- C. Larynx → nostrils → pharynx → lungs
- D. Nostrils → pharynx → larynx → trachea → alveoli

**Answer:**

The correct sequence of air passage during inhalation is :

nostrils pharynx larynx trachea alveoli

**Question 15.**

During respiration exchange of gases take place in

- A. Trachea and larynx

- B. Alveoli of lungs
- C. Alveoli and throat
- D. Throat and larynx

**Answer:**

The tiny air-sacs at the end of the smallest bronchioles are known as Alveoli. Alveoli is the place where gaseous exchange take place.

**Question 16.**

Which of the following statement (s) is (are) true about heart?

1. Left atrium receives oxygenated blood from different parts of body while right atrium receives deoxygenated blood from lungs
  2. Left ventricle pumps oxygenated blood to different body parts while right ventricle pumps deoxygenated blood to lungs
  3. Left atrium transfers oxygenated blood to right ventricle which sends it to different body parts
  4. Right atrium receives deoxygenated blood from different parts of the body while left ventricle pumps oxygenated blood to different parts of the body.
- A. (1)
- B. (2)
- C. (2) and (4)
- D. (1) and(3)

**Answer:**

Left ventricle pumps oxygenated blood to different body parts while right ventricle pumps deoxygenated blood to lungs. Whereas right atrium receives deoxygenated blood from different parts of the body while left ventricle pumps oxygenated blood to different parts of the body. Hence, Deoxygenated blood flows through the right side of the heart. Oxygenated blood flows through the left side of the heart.

**Question 17.**

What prevents backflow of blood inside the heart during contraction?

- A. Valves in heart
- B. Thick muscular walls of ventricles
- C. Thin walls of atria
- D. All of the above

**Answer:**

Valves prevent the backflow of blood inside the heart during contraction. They allow the flow of blood in only one direction.

**Question 18.**

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

- A. Labeo, Chameleon, Salamander
- B. Hippocampus, Exocoetus, Anabas
- C. Hyla, Rana, Draco
- d. Whale, Dolphin, Turtle

**Answer:**

Single circulation is found in fishes. Hippocampus, Exocoetus, Anabas exhibit single circulation of blood because these animals belong to pisces.

**Question 19.**

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



**Answer:**

In fishes, heart sends the blood to gills from where blood is circulated to different organs.

**Question 20.**

Choose the correct statement that describes arteries.

- A. They have thick elastic walls, blood flows under high pressure; collect blood from different organs and bring it back to the heart
- B. They have thin walls with valves inside, blood flows under low pressure and carry blood away from the heart to various organs of the body
- C. They have thick elastic walls, blood flows under low pressure; carry blood from the heart to various organs of the body
- D. They have thick elastic walls without valves inside, blood flows under high pressure and carry blood away from the heart to different parts of the body.

**Answer:**

Arteries have thick elastic walls without valves inside, blood flows under high pressure and carry blood away from the heart to different parts of the body.

**Question 21.**

The filtration units of kidneys are called

- A. Urethra
- B. Ureter
- C. Neurons
- D. Nephrons

**Answer:**

The functional unit of human excretory system is nephrons. Urine formation takes place in nephrons of kidneys.

**Question 22.**

Oxygen liberated during photosynthesis comes from

- A. Water

- B. Chlorophyll
- C. Carbon dioxide
- D. Glucose

**Answer:**

The oxygen liberated during photosynthesis by green plants comes from water.

**Question 23.**

The blood leaving the tissues becomes richer in

- A. Carbon dioxide
- B. Water
- C. Haemoglobin
- D. Oxygen

**Answer:**

The blood leaving the tissues becomes richer in carbon dioxide. When the oxygenated blood passes through the capillaries of the tissue, it gives oxygen to the body cells and takes carbon dioxide, produced during respiration. Thus, it becomes richer in carbon dioxide.

**Question 24.**

Which of the following is an incorrect statement?

- A. Organisms grow with time
- B. Organisms must repair and maintain their structure
- C. Movement of molecules does not take place among cells
- D. Energy is essential for life processes

**Answer:**

Movement of molecules does not take place among cells

**Question 25.**

The internal (cellular) energy reserve in autotrophs is

- A. Glycogen
- B. Protein
- C. Starch
- D. Fatty acid

**Answer:**

The food prepared in the plant (autotroph) by the process of photosynthesis is glucose then it gets stored in plant leaves in the form of starch.

**Question 26.**

Which of the following equations is the summary of photosynthesis?

- A.  $6\text{CO}_2 + 12\text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{CO}_2 + 6\text{H}_2\text{O}$
- B.  $6\text{CO}_2 + \text{H}_2\text{O} + \text{Sunlight} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + \text{O}_2 + 6\text{H}_2\text{O}$
- C.  $6\text{CO}_2 + 12\text{H}_2\text{O} + \text{Chlorophyll} + \text{Sunlight} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 + 6\text{H}_2\text{O}$
- D.  $6\text{CO}_2 + 12\text{H}_2\text{O} + \text{Chlorophyll} + \text{Sunlight} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{CO}_2 + 6\text{H}_2\text{O}$

**Answer:**

Photosynthesis is the process by which green plants make their own food by using simple substances like  $\text{CO}_2$  and water in the presence of sunlight.

**Question 27.**

Choose the event that does not occur in photosynthesis

- A. Absorption of light energy by chlorophyll
- B. Reduction of carbon dioxide to carbohydrates
- C. Oxidation of carbon to carbon dioxide
- D. Conversion of light energy to chemical energy

**Answer:**

The process of photosynthesis takes place in the following three steps:

- Absorption of light energy by chlorophyll
- Conversion of light energy to chemical energy and splitting of water molecules into hydrogen and oxygen.
- Reduction of carbon dioxide to carbohydrates.

**Question 28.**

The opening and closing of the stomatal pore depends upon

- A. Oxygen
- B. Temperature
- C. Water in guard cells
- D. Concentration of CO<sub>2</sub> in stomata

**Answer:**

The guard cells regulate the opening and closing of stomatal pores. They swell, when water flows into the guard cells and stomatal pores get opens. Similarly, when the guard cells lose water, they shrink, become straight and the stomatal pores get closed.

**Question 29.**

Choose the forms in which most plants absorb nitrogen

1. Proteins
2. Nitrates and Nitrites
3. Urea
4. Atmospheric nitrogen

A. (1) and (2)

B. (2) and (3)

C. (3) and (4)

D. (1) and (4)

**Answer:**

Plants take up nitrogen from the soil in the form of inorganic salts called nitrates (or nitrites), or in the form of organic compounds which are produced by bacteria from the atmospheric nitrogen.

**Question 30.**

Which is the first enzyme to mix with food in the digestive tract?

A. Pepsin

B. Cellulase

C. Amylase

D. Trypsin

**Answer:**

Saliva is a watery fluid which contains an enzyme called salivary amylase. Salivary amylase acts on starch and breaks down it into sugar.

**Question 31.**

Which of the following statement(s) is (are) correct?

1. Pyruvate can be converted into ethanol and carbon dioxide by yeast

2. Fermentation takes place in aerobic bacteria

3. Fermentation takes place in mitochondria

4. Fermentation is a form of anaerobic respiration

A. (1) and (3)

B. (2) and (4)

C. (1) and (4)

D. (2) and (3)

**Answer:**

Fermentation is a form of anaerobic respiration. Pyruvate can be converted into ethanol and carbon dioxide by yeast during fermentation.

**Question 32.**

Lack of oxygen in muscles often leads to cramps among cricketers. This results due to

- A. Conversion of pyruvate to ethanol
- B. Conversion of pyruvate to glucose
- C. Non conversion of glucose to pyruvate
- D. Conversion of pyruvate to lactic acid

**Answer:**

Due to the lack of oxygen, anaerobic respiration takes place in the human muscles that leads to conversion of Pyruvate (prepared after breakdown of Glucose during cellular respiration) into Lactic acid, which leads to muscle cramps.

**Question 33.**

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

**Answer:**

Urine formation takes place inside the kidney. Ureter carries urine from kidneys to bladder. Bladder stores the urine temporarily. Then the urine is discharged out of the body through urethra.

**Question 34.**

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

- A. Cytoplasm
- B. Chloroplast
- C. Mitochondria
- D. Golgi body

**Answer:**

In the absence of oxygen, pyruvic acid is converted into lactic acid in the cytoplasm of the cell.

Short Answer Questions

**Question 1.**

Name the following:

- (1) The process in plants that links light energy with chemical energy
- (2) Organisms that can prepare their own food
- (3) The cell organelle where photosynthesis occurs
- (4) Cells that surround a stomatal pore
- (5) Organisms that cannot prepare their own food
- (6) An enzyme secreted from gastric glands in stomach that acts on proteins.

**Answer:**

- (1) Photosynthesis
- (2) Autotrophs
- (3) Chloroplast
- (4) Guard cells

(5) Heterotrophs

(6) Pepsin

**Question 2.**

“All plants give out oxygen during day and carbon dioxide during night”. Do you agree with this statement? Give reason.

**Answer:**

**No**, this statement is not completely justified. The process of respiration occurs throughout the day and night as well like other living things. During the day through respiration carbon dioxide is produced which is used in process of photosynthesis by leaves. The process of photosynthesis does not take place in the night, hence it occurs only in the day time. Oxygen is produced by plants only during the day time.

**Question 3.**

How do the guard cells regulate opening and closing of stomatal pores?

**Answer:**

The guard cells regulate the opening and closing of stomatal pores. They swell, when water flows into the guard cells and stomatal pores get opens. Similarly, when the guard cells lose water, they shrink, become straight and the stomatal pores get closed.

**Question 4.**

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

**Answer:**

Plant which is placed in continuous light will live longer because it can do the process of photosynthesis by using light and produce oxygen which is required for the respiration. While plant which is placed in dark does not do the process of photosynthesis due to lack of light.



**Question 5.**

If a plant is releasing carbon dioxide and taking in oxygen during the day, does it mean that there is no photosynthesis occurring? Justify your Solution.

**Answer:**

If plant is releasing CO<sub>2</sub> and taking in O<sub>2</sub>, it doesn't mean that no photosynthesis is happening in the plant. In day time, plants perform both respiration and photosynthesis simultaneously. Plants use up all carbon dioxide released by respiration in the process of photosynthesis. Similarly, some of the oxygen produced during photosynthesis is used up in respiration.

**Question 6.**

Why do fishes die when taken out of water?

**Answer:**

Fishes do not have lungs which can take oxygen from air. Hence, they die when taken out of water. They have gills which can only take oxygen dissolved in water.

**Question 7.**

Differentiate between an autotroph and a heterotroph.

**Answer:**

Differences between an autotroph and a heterotroph:

Autotroph	Heterotroph
Autotroph organisms can synthesize their own food from inorganic substances like CO <sub>2</sub> and water.	Heterotroph organisms obtain their food directly or indirectly from autotrophs.
Autotroph contain green pigment called chlorophyll.	Heterotroph do not contain green pigment.
Examples: All green plants and some bacteria.	Examples: All animals and fungi.

**Question 8.**

Is 'nutrition' a necessity for an organism? Discuss.

**Answer:**

Nutrition is a physical process by which living organisms obtain raw materials (nutrients) to sustain their life. Carbohydrates, fats, proteins, minerals, vitamins and water are examples of nutrients which organisms obtain from their surroundings. Nutrition is necessary for organisms as it provides energy to them for metabolic activities, growth and tissue repair.

**Question 9.**

What would happen if green plants disappear from earth?

**Answer:**

Green plants are the source of food for all living organisms. So, if all the green plants disappear from the earth, then all the organisms will die because of starvation.

**Question 10.**

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

**Answer:**

The plant whose leaves are coated with vaseline will not remain healthy for long because vaseline will make a coating on the leaves. This will close the stomata due to which plant will stop exchange of gases and transpiration. This plant won't be able to get carbon dioxide for photosynthesis. Thus, the plant will not be able to prepare its food. As a result, plant will die.

**Question 11.**

How does aerobic respiration differ from anaerobic respiration?

**Answer:**

Aerobic Respiration	Anaerobic Respiration
Takes Place when oxygen is present.	Takes place when oxygen is not present.
Food gets broken down completely.	Food get broken down partially.
End products include carbon dioxide and water.	End products include ethanol and carbon dioxide (in yeast) and lactic acid (in animal muscles).
Produces lot of energy.	Produces less energy.
Example: Human beings	Example: Yeast

Question 12.

Match the words of column A with that of column B

Column A	Column B
(a) Phloem	(i) Excretion
(b) Nephron	(ii) Translocation of food
(c) Veins	(iii) Clotting of blood
(d) Platelets	(iv) Deoxygenated blood

**Answer:**

(a) → (ii), (b) → (i), (c) → (iv), (d) → (iii)

**Question 13.**

Differentiate between an artery and a vein.

**Answer:**

Artery

(i) Thick-walled blood vessel

(ii) Blood flows from the heart to different parts of the body

(iii) Blood flows with high pressure with a high speed

(iv) Valves are absent

Vein

- Thin walled blood vessel.
- Brings blood from the different parts of the body to the heart.
- Blood flows with low pressure and with a low speed.
- Contains valves which permit blood flow only towards the heart.

**Question 14.**

What are the adaptations of leaf for photosynthesis?

**Answer:**

The adaptations of leaf for photosynthesis are as follows:

1. Leaf has numerous stomata on its surface to absorb carbon dioxide from the air.

2. Leaf has chloroplast inside the leaf cells. The process of photosynthesis takes place in the chloroplast.

**Question 15.**

Why is small intestine in herbivores longer than in carnivores?

**Answer:**

Cellulose is a carbohydrate that is digested with difficulty. Herbivores animals like cow, ox, and buffalo that eat only plants (grass) have a longer small intestine to allow the cellulose, present in the plants to be digested completely.

**Question 16.**

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

**Answer:**

The mucus helps to protect the stomach wall from the secretion of hydrochloric acid. If mucus is not secreted by gastric glands, hydrochloric acid will cause the erosion of inner lining of stomach leading to the formation of ulcers in the stomach.

**Question 17.**

What is the significance of emulsification of fats?

**Answer:**

Emulsification is the process of breaking down of the large fat molecule into smaller molecule and make them water soluble. Thus, it becomes easy for the related enzyme to digest the fat.

**Question 18.**

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

**Answer:**

The inner surface of small intestine has numerous finger-like structures, called Villi. Villi increase the surface area of small intestine so that optimal absorption takes place.

**Question 19.**

Match Group (A) with Group (B)

A	B
(a) Autotrophic nutrition	(i) Leech
(b) Heterotrophic nutrition	(ii) Paramecium
(c) Parasitic nutrition	(iii) Deer
(d) Digestion in food vacuoles	(iv) Green plants

**Answer:**



(a) → (iv), (b) → (iii), (c) → (i), (d) → (ii)

**Question 20.**

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

**Answer:**

The oxygen content of water is much less than the oxygen content of air and hence rate of breathing in aquatic organisms is faster than in terrestrial organisms.

**Question 21.**

Why is blood circulation in human heart called double circulation?

**Answer:**

In double circulation, blood passes through the heart twice in one complete cycle of the body.

**Question 22.**

What is the advantage of having four chambered heart?

**Answer:**

The four-chambered heart is found in all mammals, birds and in the crocodile. In four chambered heart, left half is completely separated from right half by septa. Thus, It prevents the mixing of oxygenated and deoxygenated blood.

Second, it allows the efficient supply of oxygenated blood to all parts of the body. This is useful in animals that have high energy needs such as mammals and birds.

**Question 23.**

Mention the major events during photosynthesis.

**Answer:**

The process of photosynthesis takes place in the following three steps:

- Absorption of light energy by chlorophyll

- Conversion of light energy to chemical energy and splitting of water molecules into hydrogen and oxygen.
- Reduction of carbon dioxide to carbohydrates.

**Question 24.**

In each of the following situations what happens to the rate of photosynthesis?

- (i) Cloudy days
- (ii) No rainfall in the area
- (iii) Good manuring in the area
- (iv) Stomata get blocked due to dust
- (v) What causes movement of food inside the alimentary canal?

**Answer:**

- (i) The rate of photosynthesis decreases in cloudy days.
- (ii) The rate of photosynthesis decreases in the area where there is no rainfall for a considerable time.
- (iii) There is no effect of manure on rate of photosynthesis.
- (iv) The rate of photosynthesis decreases when dust gathers on the leaves.
- (v) The contraction and expansion movements of the oesophagus called peristaltic movements, push the food down inside the alimentary canal.

**Question 25.**

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

**Answer:**

The energy currency in the living organisms is called as “ATP”. During anaerobic respiration in lower organisms, it is produced in cytoplasm while in higher organisms, which respire aerobically, it is produced in mitochondria.

**Question 26.**

What is common for cuscuta, ticks and leeches?

**Answer:**

All are parasites because they derive their food from other living organisms without killing them.

**Question 27.**

Explain the role of mouth in digestion of food.

**Answer:**

In human beings, digestion of food starts from the mouth. Mouth opens into a chamber or cavity called buccal cavity. The buccal cavity contains teeth, tongue and salivary glands. The teeth cut the food into small pieces, chew and grind it. Thus, teeth help in physical digestion. Salivary glands produce saliva which mixes with the food. Saliva is a watery fluid that makes the food slippery for swallowing. These glands help in chemical digestion of food.

The saliva contains an enzyme called salivary amylase which digests the starch into maltose sugar.

**Question 28.**

Why do veins have thin walls as compared to arteries?

**Answer:**

Veins have thin walls because blood flows inside them with low pressure and with a low speed. Whereas arteries have thick walls because blood flows inside them with high pressure and with a high speed.

**Question 29.**

What are the functions of gastric glands present in the wall of the stomach?

**Answer:**

Gastric glands performs following functions:

- (1) They release mucus which protect the stomach wall from its own secretions of hydrochloric acid.
- (2) They produce gastric acid which makes acidic medium inside the stomach.
- (3) They release the gastric enzymes pepsin and rennin.

**Question 30.**

Match the terms in Column (A) with those in Column (B)

Column A	Column B
(a) Trypsin	(i) Pancreas
(b) Amylase	(ii) Liver
(c) Bile	(iii) Gastric glands
(d) Pepsin	(iv) Saliva

**Answer:**

(a) → (i), (b) → (iv), (c) → (ii), (d) → (iii)

**Question 31.**

Name the correct substrates for the following enzymes:

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

**Answer:**

(a) Trypsin: peptide, (b) Amylase: starch, (c) Pepsin: protein, (d) Lipase: fat

**Question 32.**

What will happen if platelets were absent in the blood?

**Answer:**

The main function of platelets is to prevent bleeding. Platelets helps in the coagulation of blood (clotting of blood) in a cut or wound. No blood coagulation would take place in the absence of platelets. This would be a dangerous situation; in case of an injury.

**Question 33.**

Plants have low energy needs as compared to animals. Explain.

**Answer:**

Plants have low energy needs as compared to animals because they do not move. Moreover, in a large plant there are many dead cells like sclerenchyma because of which they also need less energy.

**Question 34.**

Why and how does water enter continuously into the root xylem?

**Answer:**

Xylem tissue transports water and minerals in plants from the soil to leaves. Xylem vessels and tracheids are elements of xylem tissues. They are interconnected in roots, stem and leaves and form a continuous system of water-conducting channels reaching all parts of the plant. Plants take in water from the soil through the roots. The roots have root hairs to absorb water and minerals from the soil by diffusion. Each root hair is single-celled structure. The absorbed water and minerals passes from cell to cell by osmosis through epidermis, root cortex, endodermis and then

reach the root xylem. Root pressure is responsible for transport of water up to root xylem. The water enters the root xylem into the stem xylem and then reaches the leaves from the petioles.

**Question 35.**

Why is transpiration important for plants?

**Answer:**

The loss of water in the form of vapour from the aerial parts of the plant is known as transpiration. Transpiration helps in the upward movement of water and dissolved minerals from the roots to the leaves through the stem. Moreover, transpiration is a way through which plants get rid of excess water. So, transpiration is important for plants.

**Question 36.**

How do leaves of plants help in excretion?

**Answer:**

Leaves of plants help in excretion in many ways:

1. Excess of water in plant is discarded by the process of transpiration that takes place through the leaves.
2. Gaseous waste i.e., carbon dioxide is removed through stomata present on the leaves.
3. Some waste materials get accumulated in older leaves. When old leaves fall, the waste materials are excreted along with the leaves.

**Question 37.**

Explain the process of nutrition in Amoeba.

**Answer:**

Nutrition in amoeba: Nutrition in amoeba involves the following steps-

(i) Ingestion: Amoeba is a unicellular organism which feeds on microscopic plants and animals which float on water. The mode of nutrition in Amoeba is holozoic.

Amoeba has no mouth for ingestion of food. It ingests the food by using finger-like extension of cell surface called pseudopodia. The food is engulfed with little water to form a food vacuole.

(ii) Digestion: The food is digested in the food vacuole by digestive enzymes which break down the food into small and soluble molecules by chemical reactions.

(iii) Absorption: The digested food, present in the food vacuole is absorbed directly into the cytoplasm by diffusion. The digested food spreads out from the food vacuole into the whole amoeba cell. After absorption, the food vacuole shrinks and disappears.

(iv) Assimilation: In this step, the absorbed food is used to obtain energy through respiration and other metabolic activities which lead to the growth of Amoeba.

(v) Egestion: Amoeba has no particular point from which the egestion takes place. When considerable amount of undigested food collects inside the cell, then its cell membrane ruptures at any place. Through this, the undigested food is thrown out of the body.

### **Question 38.**

Describe the alimentary canal of man.

### **Answer:**

The human alimentary canal has following main parts:

**Mouth:** Alimentary canal starts from the mouth and ends in the anus. Mouth opens into a chamber or cavity called buccal cavity. The buccal cavity contains teeth, tongue and salivary glands. The teeth cut the food into small pieces, chew and grind it.

**Oesophagus:** Buccal cavity opens into pharynx which leads to a long tube called Oesophagus. Oesophagus is also known as food pipe. The walls of Oesophagus are highly muscular. Digestion does not occur in the Oesophagus. It carries the food down into the stomach.

**Stomach:** Stomach is a bag-like organ. Highly muscular walls of the stomach help in churning the food.



**Small Intestine:** It is a highly coiled tube-like structure. The small intestine is longer than the large intestine but its lumen is smaller than that of the large intestine. The small intestine is divided into three parts, viz. duodenum, jejunum and ileum. In humans, small intestine is the site of complete digestion of food like carbohydrates, proteins and fats.

**Large Intestine:** Undigested food goes into the large intestine. Anus is the opening at the end of the alimentary canal through which undigested food is thrown out.

**Question 39.**

Explain the process of breathing in man.

**Answer:**

Breathing is the process by which organisms take oxygen from the air and release carbon dioxide. It is a simple process which is controlled by the diaphragm and the intercostal muscles. Breathing in human has two phases- Inhalation and exhalation.

During inhalation, the diaphragm contracts and flattens and the intercostal muscles contract to pull the ribs up and out. Thus, the lungs expand and air is inhaled.

During exhalation, diaphragm relaxes and moves up, the lungs contract and air is exhaled.

**Question 40.**

Explain the importance of soil for plant growth.

**Answer:**

Soil is important for plant growth because-

Soil serves as a reservoir of water and mineral absorbed by plants' roots to support plant growth and development.

Soil holds the plants and provides the base on which all the terrestrial plants and even some aquatic plants grow.

## Long Answer Questions

### **Question 1.**

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

#### **Answer:**

(i) Carbohydrates - The digestion of carbohydrates occurs in the mouth, stomach and small intestine. In the mouth, saliva mixes with the food. Saliva contains an enzyme called salivary amylase which partially digests the carbohydrate and converts it into maltose sugar. When the slightly digested food reaches into the small intestine, pancreatic amylase present in the pancreatic juice breaks down the starch. The walls of the small intestine secrete the intestinal juice which finally converts it into glucose and completes the digestion of carbohydrates.

(ii) Fats - The digestion of fats begins in the stomach. In the stomach, gastric glands secrete a small amount of gastric lipase that breaks down the fats present in the food. In the small intestine, the pancreatic lipase breaks down the emulsified fats. The intestinal juice, secreted by the walls of small intestine, finally converts the fats into fatty acids and glycerol.

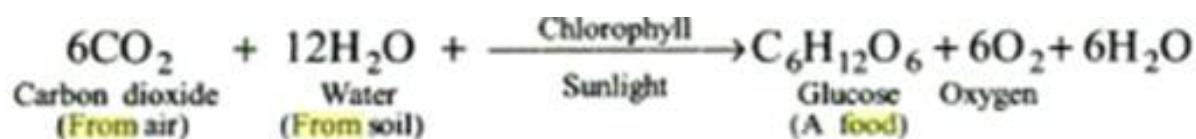
(iii) Proteins - The digestion of proteins begins in the stomach. In the stomach, gastric glands secrete gastric juice which contains an enzyme called pepsin which converts the proteins into peptones. Pancreatic juice contains trypsin which digests the proteins into peptides and the intestinal juice completes the process of digestion of proteins thus converting it into amino acids.

### **Question 2.**

Explain the mechanism of photosynthesis.

#### **Answer:**

The process of photosynthesis can be represented as:



The process of photosynthesis takes place in the green leaves of a plant. Plants need carbon dioxide and water for the process of photosynthesis. Plants take carbon dioxide from the air. Carbon dioxide enters the leaves through tiny pores present on the leaves' surface called stomata. Plants take water from the soil through their roots by the process of osmosis. The xylem vessels then transport the water to the leaves where it reaches the chloroplast containing cells and is utilized in photosynthesis. The process of photosynthesis takes place in the presence of sunlight. The sunlight provides energy required to carry out the chemical reactions involved in the preparation of food. This sunlight energy is absorbed by the green pigment called chlorophyll. The process of photosynthesis takes place in the following three steps:

- Absorption of light energy by chlorophyll
- Conversion of light energy to chemical energy and splitting of water molecules into hydrogen and oxygen.
- Reduction of carbon dioxide to carbohydrates.

### **Question 3.**

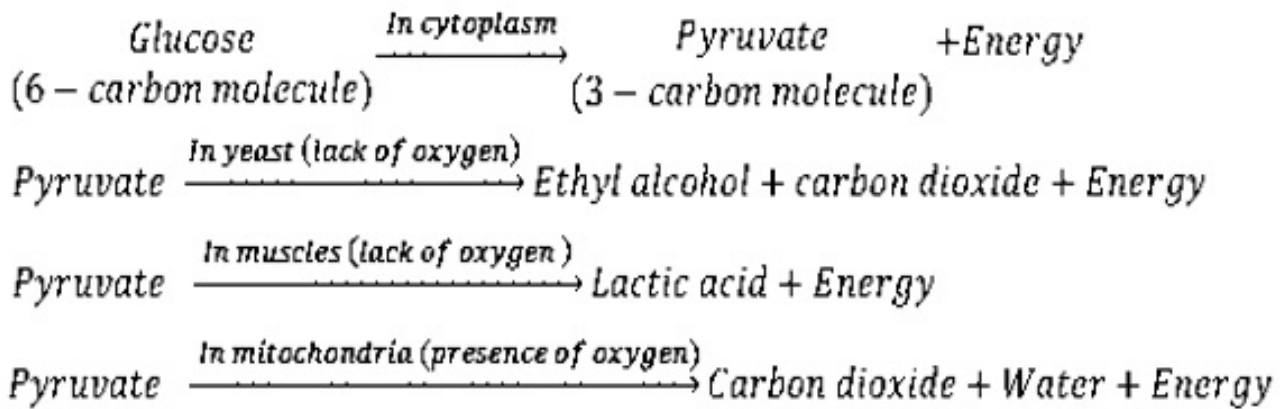
Explain the three pathways of breakdown in living organisms.

#### **Answer:**

At first, glucose is broken down into three carbon molecule called pyruvate. This process happens in the cytoplasm of cells of all organisms. On the basis of presence or absence of oxygen, it is two types- Aerobic respiration and Anaerobic respiration.

**Aerobic Respiration:** This type of respiration happens in the presence of oxygen. In this respiration, glucose is completely oxidized into carbon dioxide and water. Energy is also released at the end of this process.

**Anaerobic Respiration:** This process takes place in the absence of oxygen. In this case, pyruvic acid is either converted into ethyl alcohol or lactic acid. Ethyl alcohol is usually formed in case of anaerobic respiration in microbes; like yeast or bacteria. Lactic acid is formed in some microbes as well as in the muscle cells.



**Question 4.**

Describe the flow of blood through the heart of human beings.

**Answer:**

Following steps are included in the flow of blood through the heart of human beings:

- (i) The pulmonary vein brings the oxygenated blood from the lungs in the left atrium of the heart.
- (ii) Left atrium contracts and pumps blood into the left ventricle through valve.
- (iii) When the left ventricle contracts, the oxygenated blood enters the main artery called aorta. The blood travels from the main artery to larger and smaller arteries into the capillary network.
- (iv) The aorta transports the blood to all the organs of the body except the lungs. The oxygenated blood releases oxygen, nutrients and other substances and takes on carbon dioxide and waste substances. The deoxygenated blood enters the vena cava which carry it to the right atrium of the heart.
- (v) Right atrium pumps deoxygenated blood into the right ventricle through the valve.
- (vi) When the right ventricle contracts, the deoxygenated blood enters the lungs through pulmonary artery and releases carbon dioxide and absorbs fresh oxygen from air. The blood becomes oxygenated again and is sent to the left atrium of heart by pulmonary vein for circulation in the body. This whole process is repeated continuously.

### Question 5.

Describe the process of urine formation in kidneys.

#### Answer:

Urine formation: Urine is formed inside the kidney in the nephron. Nephron is a functional unit of kidney. The blood containing waste like urea enters the glomerulus which filters the blood. Water, urea, and other salts like glucose are filtered out in renal tubule. The filtered fluid is called glomerular fluid. When the filtrate containing useful substances as well as the waste substances passes through the tubule, the useful substances like glucose, amino acids, most salts and water are reabsorbed into the blood through blood capillaries surrounding the tubule. Certain substances which are harmful and not needed by the body like urea, remain behind in the tubule. This yellowish liquid is called urine.

