

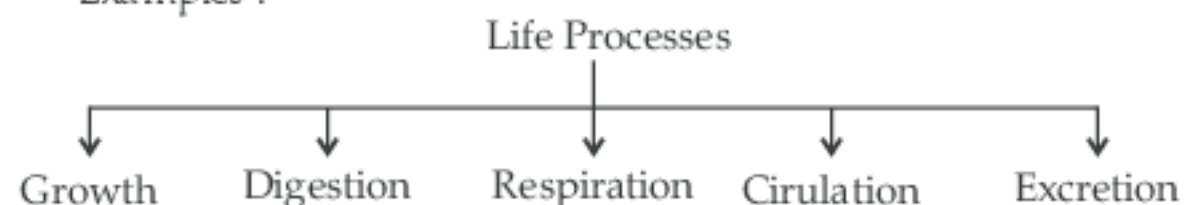
## Syllabus

➤ *Life Processes : 'Living Being'. Basic concept of nutrition, respiration, transport and excretion in plants and animals.*

## Quick Review

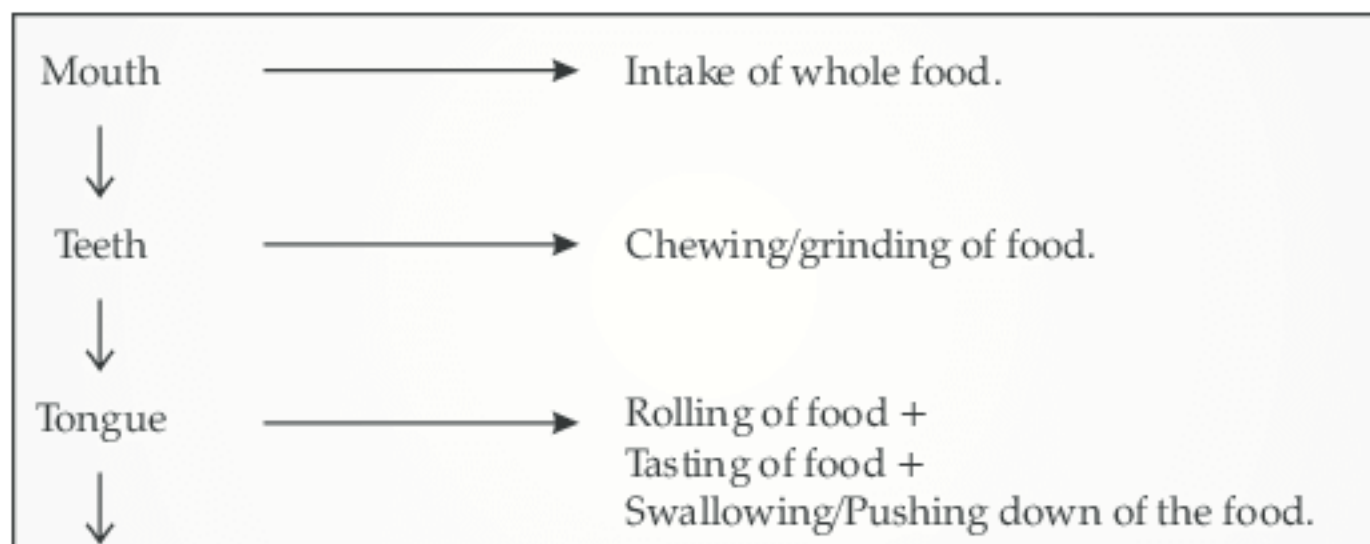
- All living things perform certain life processes like growth, excretion, respiration, circulation etc.
- All the processes like respiration, digestion, which together keep the living organisms alive and perform the job of body maintenance are called life processes.

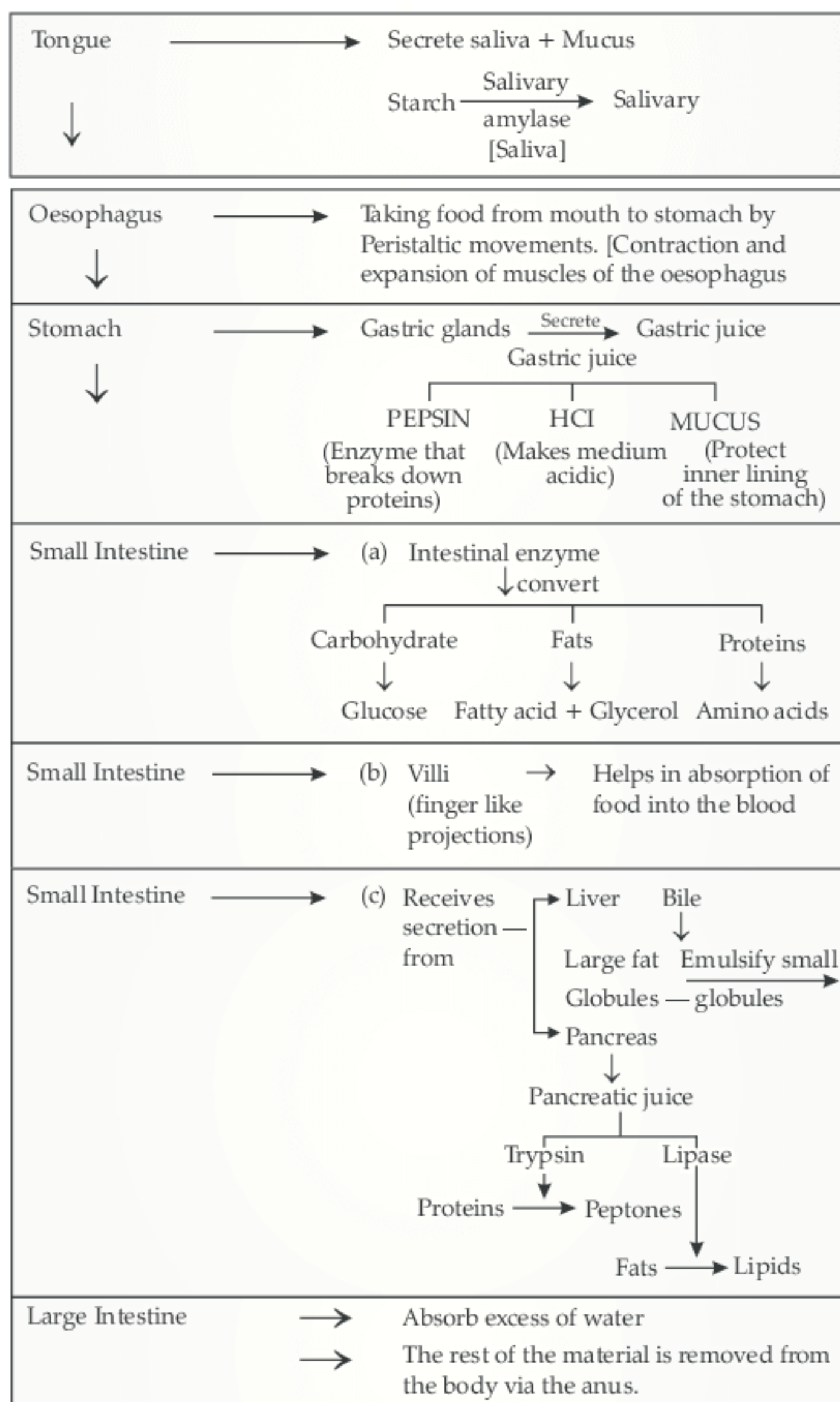
Examples :



- Energy required to carry out the different life processes, is obtained from carbon-based food sources through nutrition.
- Depending on the mode of obtaining nutrition, organisms are classified as autotrophs or heterotrophs.
  - (i) **Autotrophs** can prepare their own food from simple inorganic sources like carbon dioxide and water. (e.g., green plants, some bacteria).
  - (ii) **Heterotrophs** cannot synthesise their own food and is dependent on the autotrophs for obtaining complex organic substance for nutrition. (e.g., animals)
- Green plants prepare their food by the process of **photosynthesis**. Here, they utilise  $\text{CO}_2$ ,  $\text{H}_2\text{O}$  and sunlight, with the help of chlorophyll, giving out  $\text{O}_2$  as a by product.
- In the light reaction of photosynthesis, light energy is absorbed and converted to chemical energy in the form of ATP. Also water molecules split into hydrogen and oxygen.
- Carbon dioxide is reduced to carbohydrates in the dark phase of photosynthesis.
- Plants carry out gaseous exchange with surrounding through stomata.
- In humans, digestion of food takes place in the alimentary canal, made up of various organs and glands.
- Liver secretes bile which emulsifies fat.

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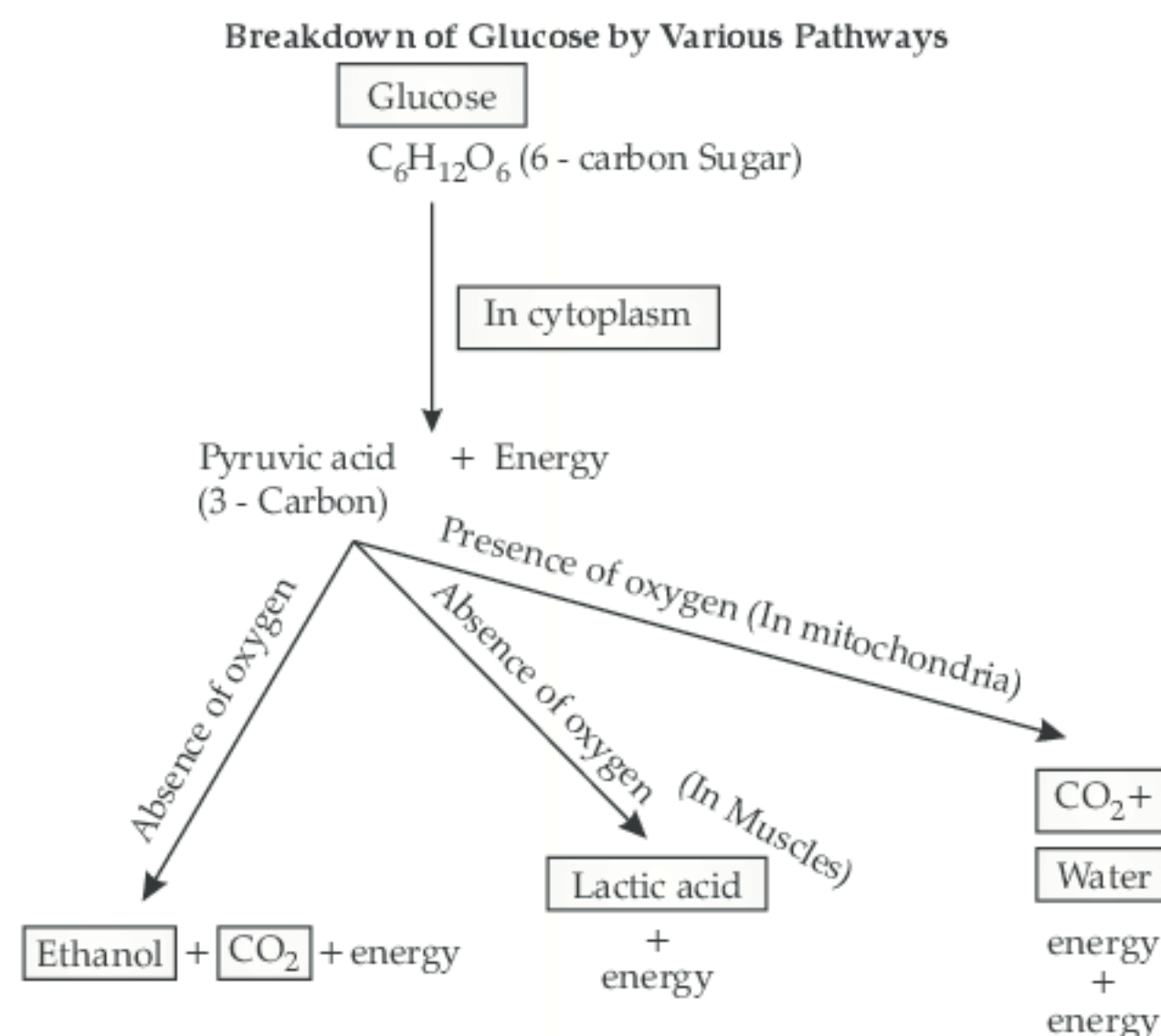




### RESPIRATION

#### Respiration involves :

- (i) Gaseous exchange : Intake of oxygen from the atmosphere and release of  $\text{CO}_2$  → Breathing
- (ii) Breakdown of simple food in order to release energy inside the cell → Cellular respiration



Respiration	
Aerobic	Anaerobic
Takes place in the presence of oxygen	Takes place in the absence of oxygen
Occurs in mitochondria	Occurs in cytoplasm
End products are CO <sub>2</sub> and H <sub>2</sub> O	End products are alcohol or lactic acid
More amount of energy is released	Less amount of energy is released

- Plants release CO<sub>2</sub> at night and oxygen during the day.
- In humans, air takes the following path on entering the nostrils.  
Nostrils → Nasal passage → Pharynx → Larynx → Trachea → Bronchus → Bronchiole → Alveolus.
- The alveoli of lungs are richly supplied with blood and are the sites where exchange of gases (O<sub>2</sub> and CO<sub>2</sub>) occurs between blood and atmosphere.
- In humans, the respiratory pigment haemoglobin, carry oxygen from lungs to different tissues of the body.
- Human heart has 4 chambers - 2 atria (right and left) and 2 ventricles (right and left). Right half of the heart receives deoxygenated blood whereas the left half receives oxygenated blood.
- Arteries carry blood from heart to different parts of the body whereas veins deliver the blood back to the heart. Arteries are connected to veins by thin capillaries, where materials are exchanged between blood and cells.
- Blood platelets are essential for clotting of blood at the place of injury and thus preventing blood loss.
- Lymphatic system consists of lymph, lymph nodes, lymphatic capillaries and lymph vessels which drain into larger veins. Lymph is also important in the process of transportation.

#### Double circulation

- Blood travels twice through the heart in one complete cycle of the body.
- **Pulmonary Circulation** : Blood moves from the heart to the lungs and back to the heart.
- **Systemic Circulation** : Blood moves from the heart to rest of the body and back to the heart.

#### Blood Vessels

Arteries		Veins	
1.	Carry oxygenated blood from heart to body parts except pulmonary artery.	1.	Carry deoxygenated blood from body parts to heart except pulmonary vein.
2.	Also called distributing vessel.	2.	Also called collecting vessel.
3.	Thick and elastic.	3.	Thin and less elastic.
4.	Deep seated	4.	Superficial as compared to arteries



**Transportation in plants**

There are two main conducting pathways in plant.

Xylem		Phloem	
1.	Carries water & minerals from the roots to other parts of the plant.	1.	Carries product of photosynthesis from leaves to the other parts of the plant.
2.	No energy is used.	2.	Energy is used from ATP.

**Transpiration :** is the process of loss of water as vapour from aerial parts of the plant.

- During excretion, the harmful metabolic nitrogenous wastes generated are removed from the body.
- Nephrons are the basic filtration units of kidneys. They carry out filtration, selective reabsorption and tubular secretion to form urine in kidney, which is then passed out through the urethra, via the ureters and urinary bladder.

**Formation of Urine**

- Each kidney contains many filtration units called as nephrons.
- Nephrons are made up of a cluster of thin walled capillaries called as glomerulus which is associated with a cup like structure called as Bowman's capsule and the long tube which terminates through this capsule.
- The renal artery brings oxygenated blood to the kidneys along with the nitrogenous wastes like urea and uric acid and many other substances.
- The blood gets filtered through the glomerulus and this filtrate enters the tubular part of nephron.
- As this filtrate moves down the tubular part, glucose, amino acids, salts and excess of water gets selectively reabsorbed by the blood vessels surrounding tubules.
- The amount of water reabsorbed depends upon :
  - \* How much excess of water is there in the body and,
  - \* How much nitrogenous wastes need to be excreted out.
- So the fluid now flowing in the tubular part is urine which gets collected in collecting ducts of nephrons.
- These collecting ducts together leave the kidney at a common point by forming the ureter.
- Each ureter drains the urine in the urinary bladder where it is stored until the pressure of expanded bladder leads to an urge to pass it out through urethra.
- This bladder is a muscular structure which is under nervous control.
- 180 litres of filtrate is formed daily but only 2 litres is excreted out as urine so the rest is reabsorbed in the body.

**Know the Terms**

- **Metabolism :** It is the sum total of all the chemical reactions which occur in a living being due to interaction amongst its molecules. It has two components—Anabolism (build-up reactions) and Catabolism (breakdown reactions).
- **Nutrition :** It is the process by which living beings procure food for obtaining energy and body building materials.
- **Autotrophic Nutrition :** It is one in which an organism is able to build up its own organic food from inorganic raw materials with the help of energy.
- **Photosynthesis :** It is the synthesis of organic food from inorganic raw materials with the help of light energy inside chlorophyll containing cells.
- **Photolysis :** Photolysis of water is photocatalytic splitting of water into its components, hydrogen and oxygen.
 
$$2\text{H}_2\text{O} \longrightarrow 4\text{H}^+ + 4\text{e}^- + \text{O}_2$$
- **Photo-phosphorylation :** It is the synthesis of energy rich molecules of ATP from ADP and inorganic phosphate with the help of light energy.
- **Compensation Point :** It is that value of a factor (e.g. light, carbon dioxide) at which the photosynthetic consumption of carbon dioxide exactly matches the liberation of  $\text{CO}_2$  in respiration.
- **Heterotrophic Nutrition :** It is that mode of nutrition in which the organisms obtain food from outside sources.
- **Digestion :** It is the enzyme mediated breakdown of complex insoluble components of food into simple soluble and absorbable forms.
- **Lysozyme :** It is an antimicrobial enzyme found in saliva, tears, egg white and many animal fluids that causes breakdown of peptidoglycan and chitin covering of microbes.
- **Peristalsis :** It is a wave of contraction behind the food and expansion in the region of contained food that occurs in the alimentary canal for pushing the food from anterior to posterior ends.
- **Succus Entericus :** It is the name of digestive juice of small intestine also known as intestinal juice.
- **Emulsification :** Emulsification of fats is conversion of large fat pieces into very fine fat globules.
- **Phagocytosis :** This is the process of ingestion of solid food particle by a cell or unicellular organism.

- **Circumvallation** : This is the method of intake of food when *Amoeba* comes in contact with a food particle or prey, it throws pseudopodia all around the same. The tips of encircling pseudopodia fuse and the prey comes to lie in a vesicle or phagosome.
- **Respiration** : It is an enzyme controlled biochemical process of stepwise oxidative breakdown of organic compounds releasing energy at various steps.
- **Cutaneous Respiration** : It is the mode of exchange of respiratory gases that occurs through skin which is thin, permeable, moist and vascularised for this function.
- **Branchial Respiration** : It is the respiration performed with the help of gills.
- **Breathing** : It is a physical process of alternate inhalation of fresh air and exhalation of foul air.
- **Aerobic respiration** : It is the stepwise complete oxidative breakdown of respiratory substrate into carbon dioxide and water with the help of oxygen that acts as terminal oxidant.
- **Glycolysis (EMP)** : It is the first step of breakdown of respiratory substrate which occurs in cytoplasm and produces two molecules of pyruvate from a molecule of glucose.
- **Kreb's Cycle** : It is a cyclic series of metabolic reactions of aerobic respiration that occur inside mitochondria. Acetyl-CoA is completely oxidised into carbon dioxide and reduced coenzymes  $\text{NADH}_2$  as well as  $\text{FADH}_2$  are produced.
- **Terminal Oxidation** : It is the combining of oxygen with hydrogen released from reduced coenzymes during oxidative phosphorylation.
- **Transportation** : It is the movement of materials from one part to another, usually from the region of their availability to the region of their use, storage or elimination.
- **Circulatory System** : It is a system of organs, tubes and a blood-like fluid that circulates various materials inside the body.
- **Haemolysis** : It is the process of destruction of RBC's.
- **Serum** : It is a whitish water fluid that is squeezed out from contracting blood clot.
- **Diapedesis** : It is the crawling of white blood corpuscles out of blood capillaries into surrounding tissues.
- **Pulse** : It is a repeated throb felt in a superficial artery of the body due to forceful pumping of the blood.
- **Translocation** : It is the movement of materials in solution form within an organism especially in phloem of plants.
- **Transpiration** : It is the loss of water in vapour form from the exposed parts of a plant.
- **Ascent of Sap** : It is the upward movement of absorbed water or sap from root to the top of the plant.
- **Excretion** : It is the process of throwing out of waste products and other harmful chemicals from the body.
- **Nephric Filtrate** : It is the fluid passed out of glomerulus due to ultrafiltration in the Malpighian capsule of a nephron.
- **Ultrafiltration** : It is the filtration under pressure of small particles, solutes and solvents, through a finely porous membrane.
- **Glomerulus** : It is a bunch of fine blood vessels or capillaries present in the depression of Bowman's capsule where ultrafiltration occurs.
- **Micturition** : It is the expulsion of urine from the body.
- **Bowman's Capsule** : It is a broad, blind cup-shaped, proximal end of a nephron in which glomerulus is located for ultrafiltration.
- **Osmoregulation** : It is the maintenance of a fixed osmotic concentration of body fluids by controlling the amount of water and salts.

## TOPIC-1

### Nutrition

#### Very Short Answer Type Questions

(1 mark each)

Q.1. Which tissue transports soluble products of photosynthesis? [KVS 2017]

Ans. Phloem. 1

Q.2. Name the tissue that transports water and minerals in plants. [DDE 2017]

Ans. Xylem. 1

Q.3. Define Peristaltic movement. [DDE 2017]

Ans. It is a wave of contraction behind the food and expansion in the region of contained food that occurs in the alimentary canal for pushing the food from anterior to posterior ends. 1



**Q.4. What is the role of saliva in the digestion of food? [Board Term I, Set-08, 2011] [DDE 2017]**

**Ans.** Saliva moistens the ingested food with mucus, sterilises it with lysozyme and partially digests starch part of food into sugar with the help of salivary amylase or ptyalin. **1**

**Q.5. What is emulsification? [DDE 2017]**

**Ans.** The breakdown of fat globules in the duodenum into tiny droplets, which provides a larger surface area on which the enzyme pancreatic lipase can act to digest the fats into fatty acids and glycerol is emulsification. **1**

**Q.6. Where does digestion of fat takes place in our body? [Board Term I, 2009]**

**Ans.** Digestion of fats occur in duodenum and jejunum parts of small intestine with the help of enzyme lipase that acts on emulsified fat to form fatty acid and glycerol. **1**

**Q.7. State the location and the function of gastric glands? [Board Term I, Set-IN14KGB, 2014]**

**Ans.** Gastric glands are present in the wall of stomach which releases hydrochloric acid, mucus and protein digesting enzyme pepsin. **1**

[CBSE Marking Scheme, 2014]

**Q.8. What is the role of acid in our stomach?**

[Board Term I, Foreign Set I, II, III, 2008]

[DDE 2017]

**Ans.** HCl of gastric juice disinfests the food and acidifies it for proper functioning of proteolytic enzyme pepsin. **1**

**Q.9. State the function of digestive enzyme.**

[Board Term I, Set-A1, 2008]

**Ans.** Digestive enzyme are hydrolytic proteinaceous substances which cause breakdown of complex and insoluble components of food into simple, soluble and absorbable substances. **1**

**Q.10. Mention the site of complete digestion of carbohydrates, proteins and fats in humans.**

[DDE-2015]

**Ans.** Small intestine in Alimentary canal. **1**

## Short Answer Type Questions-I

(2 marks each)

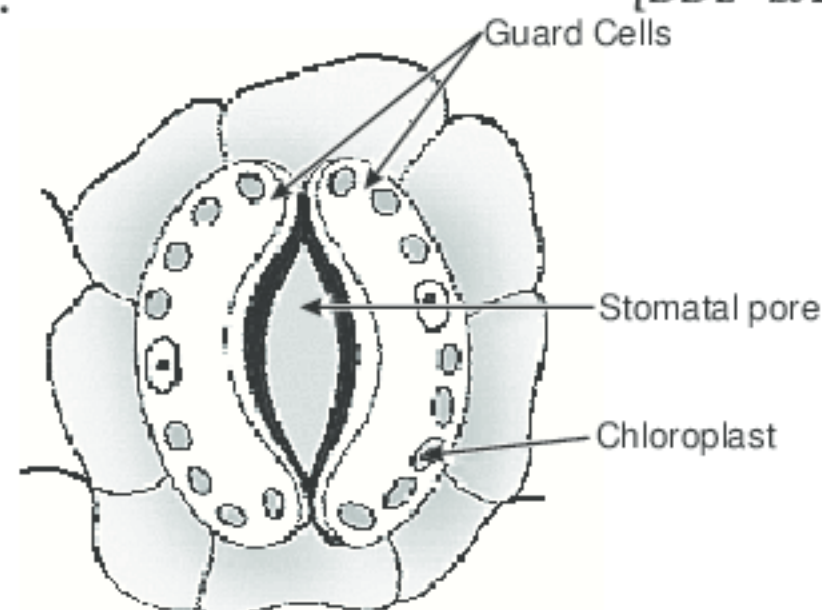
**Q.1. State one difference between autotrophic and heterotrophic mode of nutrition. [DDE 2017]**

**Ans.** Autotrophic nutrition in which organisms prepare their own food from simple inorganic sources like carbon dioxide and water.

Heterotrophic nutrition in which organisms do not synthesise their own food and is dependent on the autotrophic for obtaining complex organic substance for nutrition. **1 + 1**

**Q.2. Draw the diagram of an open stomatal pore of a leaf and label on it chloroplast and guard cells. [DDE - 2014-17]**

**Ans.**



**2**

**Q.3. Where do plants get each of the raw materials required for photosynthesis? [NCERT]**

**Ans.** The raw materials for photosynthesis are carbon dioxide and water. Terrestrial plants get carbon dioxide from environment and water from the soil. Aquatic plants obtain CO<sub>2</sub> that is present in dissolved form in water. Water is simply absorbed by the parts of plant submerged in water. **2**

**Q.4. In Nutrition a necessity for an organism? Discuss. [NCERT Exemplar 2017]**

**Ans.** Nutrition is required to provide energy for the various metabolic processes in the body. It is essential for the growth of new cells and repair or replacement of worn out cells. It is needed to develop resistance against various diseases. **2**

**Q.5. Write any two events that occur during photosynthesis. [NCT - 2014]**

**Ans.** Two events that occur during photosynthesis are :

- (i) Absorption of light energy by chlorophyll.
- (ii) Conversion of light energy into chemical energy and splitting of water molecules into hydrogen and oxygen. **1 + 1**

**Q.6. Which is the internal energy reserve in plants? Do animals have the same energy reserve? [Board Term I, Set-41, 2011, Set (C1) 2010]**

**Ans.** Plants have starch as the storage carbohydrate which act as internal energy reserve.

But animals have glycogen as internal energy reserve. **1 + 1**

**Q.7. What would happen if green plants disappear from earth? [NCERT Exemplar 2017]**

**Ans.** If all plants were to be removed from the surface of Earth, there will be excess of carbon dioxide cause there are no plants to convert it into oxygen. Green plants are the sources of energy for all organism, all herbivores will die due to starvation. **2**

**Q.8. Why does herbivores have longer small intestine than carnivores? [Board Term I, Set-5X7289R, 2014] [DDE 2017]**

**Ans.** Herbivores have longer small intestine to allow the cellulose to be digested completely. Herbivores



have longer intestine than carnivores to digest grass. The intestine would host many small bacteria that process and breakdown cellulose into glucose. 2

- U Q.9. Mention the site of complete digestion in our body. Name the end products formed on complete digestion of carbohydrates, proteins and fats. [DDE-2015]

**Ans.** Site of Complete digestion : Small intestine in alimentary canal.

End products formed are :

Proteins  $\longrightarrow$  Amino acids

Carbohydrates  $\longrightarrow$  Simple sugars

Fats  $\longrightarrow$  Fatty acids + Glycerol.  $\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2}$

- U Q.10. How is small intestine designed to absorb digested food? [DDE 2017]

**Ans.** The digested food is taken up by the walls of the intestine. The inner lining of the 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 take the absorbed food to each and every cell of the body. 2

- A Q.11. How are fats digested in our bodies? Where does this process take place. [NCERT 2017]

**Ans.** Fats are digested in the small intestine. The secretion of liver, called bile, breaks down the large globules of fats into smaller globules. This is called emulsification of fats. The bile also makes the medium alkaline so that the pancreatic enzyme containing lipase further digest fats to form fatty acids. 1 + 1

- R Q.12. What are final products of carbohydrates, proteins and fats after their digestion? [Board Term I, 2011]

**Ans.** Carbohydrates : Glucose  $\frac{1}{2}$   
 Proteins : Amino acid  $\frac{1}{2}$   
 Fats : Glycerol + Fatty acid  $\frac{1}{2} + \frac{1}{2}$

- U Q.13. Explain the significance of peristaltic movement that occur all along the gut during digestion.

[Board Term I, Set (16) 2011, Set (1), 2010]

**Ans.** It is necessary to move the food in a regulated manner along the digestive tube so that it can be processed properly in each part. 1

The lining of canal has muscles that contract rhythmically in order to push the food forward. 1  
 This is known as peristaltic movement.

- U Q.14. Why does the medium become acidic in mouth? What is the ill effect of this acidic medium? How can this be prevented? [Board Term I, Set-22, 2011]

**Ans.** (i) Bacteria present in the mouth produce acids by degradation of sugar and food particles in the mouth that may bring down pH in the mouth below 5.5. 1

(ii) Tooth enamel get corroded by the action of acids and tooth decay occurs.  $\frac{1}{2}$

(iii) By cleaning the teeth with tooth paste which is basic in nature.  $\frac{1}{2}$

- U Q.15. What function is served by the following :

(i) Gastric Sphincter ?

(ii) Anal Sphincter ? [Board Term I, Set-28, 2011]

**Ans.** (i) Gastric Sphincter : Controls the release of food from the stomach to small intestine.

(ii) Anal Sphincter : Controls the release of undigested waste from the rectum through the anus. 1 + 1

- R Q.16. Some finger like projections are present in the inner wall of small intestine. Write their names? Why are they important? [Board Term I, Set-42, 2011]

**Ans.** Small finger like projections are villi.

They increase the surface area for absorption of digested food. 1 + 1

## Short Answer Type Questions-II

(3 marks each)

- U Q.1. State the necessary conditions for autotrophic nutrition and name the by product. Mention the source of this by product.

[Board Term I, Set-JYNE6XG, 2ZGOVVV, 2015]

**Ans.** Conditions necessary for autotrophic nutrition are : Sunlight, Chlorophyll, Carbon dioxide and water. By products are carbohydrates in the form of starch and oxygen. 1 + 1 + 1

- U Q.2. Describe heterotrophic mode of nutrition and give its examples. Name the three types of this nutrition. [Board Term I, Set-WH1SGOB, 2014]

**Ans.** It is the mode of nutrition in which an organism cannot make its own food and depends on other organisms for food. All the animals including man, most bacteria and some fungi have heterotrophic mode of nutrition and these organisms are called heterotrophs.

Holozoic, Saprophytic and Parasitic. 3

[CBSE Marking Scheme, 2014]

- U Q.3. Write three events which occur during the process of photosynthesis.

[Board Term I, Set WDCXXOD, 2016] [DDE 2017]

**Ans.** Three events which occur during photosynthesis :

(i) Absorption of light energy by chlorophyll.

(ii) Conversion of light energy to chemical energy and splitting of water molecules into hydrogen and oxygen.

(iii) Reduction of carbon dioxide to carbohydrates.

[CBSE Marking Scheme 2016] 1 + 1 + 1

- U Q.4. Where does digestion start in our alimentary canal? Name the enzyme secreted in that part and write its function.

[Board Term I, Set-IZHNPNO, 2016]



**Ans.** Digestion starts in the buccal cavity in the mouth. The enzyme secreted in buccal cavity is salivary amylase. Salivary amylase enzyme help in the digestion of starch. 1 + 1 + 1

**Q.5.** Name three different glands associated with the digestive system in humans. Also name their secretions. [Board Term I, Set-37, 2012]

**Ans.**

S. No.	Name of the glands	Name of Secretions
(i)	Salivary glands	Saliva contains enzyme, ptyalin
(ii)	Gastric glands	Secrete gastric juice, HCl, mucus, pepsin.
(iii)	Liver	Bile juice.
(iv)	Intestinal glands	Intestinal juice.
(v)	Pancreas	Pancreatic juice which contains trypsin, lipase and amylase.

(Any three) 1 + 1 + 1

[CBSE Marking Scheme, 2012]

**Q.6.** (i) Name the extensively coiled structure of alimentary canal.

(ii) Compare length of the small intestine in herbivores and carnivores.

[Board Term I, Set-3R6QRQL, 2013]

**Ans.** (i) Small intestine.

(ii) Herbivores have longer small intestine for digestion of cellulose while carnivores have a shorter small intestine due to early digestion of meat.

[CBSE Marking Scheme, 2013] 1 + 2

**Q.7.** In human alimentary canal, name the site of complete digestion of various components of food. Explain the process of digestion.

[Board Term I, Set-31, 2012]

**Ans.** Small intestine.  $\frac{1}{2}$

Secretions of liver and pancreas mixes with food. Pancreatic enzymes make it alkaline. Bile juice from liver too helps in it. Bile salts break the fat present in the form of large globules into smaller ones, increasing the efficiency of enzyme action. Enzymes like trypsin digests proteins and lipase breaks down fats. Intestinal juice convert proteins to amino acids, complex carbohydrate to glucose and fat into fatty acids and glycerol.  $2\frac{1}{2}$

[CBSE Marking Scheme, 2012]

**Q.8.** The inner lining of the small intestine has numerous finger like projections. What are they called? List their functions.

[Board Term I, Set-WJ7QPA9, 2013]

**Ans.** Villi.

(i) Villi are richly supplied with blood vessels which take the absorbed food to each and every cell of the body.

(ii) It also absorbs water.

(iii) They increase the surface area for the absorption of food. [CBSE Marking Scheme, 2013] 1 + 1 + 1

**Q.9.** Name the following :

- Where food is completely digested?
- Juice that contains trypsin enzyme.
- Who secretes bile juice?
- That absorbs water from unabsorbed food.
- Two secretions released by gastric glands.

[Board Term I, Set-44, 2012]

**Ans.** (i) Small intestine

(ii) Pancreatic juice

(iii) Liver

(iv) Large intestine

(v) HCl and Enzymes—pepsin, mucus.

(Any three) 1 + 1 + 1

[CBSE Marking Scheme, 2012]

**Q.10.** (a) List two functions performed by dilute hydrochloric acid in our stomach.

(b) Name the raw materials required for photosynthesis. [Board Term I, Set-44, 2012]

**Ans.** (a) (i) Dilute HCl makes the medium acidic. 1

(ii) It activates the enzyme pepsin. 1

(b) CO<sub>2</sub> and water. [CBSE Marking Scheme, 2012] 1

**Q.11.** List the role of each of the following in our digestive system :

(i) Muscles of Stomach wall

(ii) Hydrochloric acid

(iii) Mucus. [Board Term I, Set-48, 2012]

**Ans.** (i) Help in mixing the food thoroughly with more digestive juice by peristalsis. 1

(ii) Creates an acidic medium which facilitates the action of the enzyme pepsin. 1

(iii) Protects the inner lining of the stomach from the action of the acid. 1

[CBSE Marking Scheme, 2011]

**Q.12.** (i) Explain the role of bile juice in digesting food.

(ii) Mention the purpose of making urine.

[Board Term I, Set-39, 2012]

**Ans.** (i) The food coming from the stomach is acidic and has to be made alkaline for the pancreatic enzyme to act. Bile juice accomplishes this. Bile salts break-down larger globules of fats into smaller globules increasing the efficiency of enzyme action. 2

(ii) The purpose of making urine is to filter out waste products (urea or uric acid) from the blood. 1

[CBSE Marking Scheme, 2012]

**Q.13.** Name the enzyme present in pancreatic juice and give their functions.

[Board Term I, Set-41, 2012]

**Ans.** (i) Trypsin + Proteins → Amino acids

(ii) Amylase + Carbohydrates → Simple sugars

(iii) Lipase + Fats → Fatty acids + Glycerol.

[CBSE Marking Scheme, 2012] 1 + 1 + 1



## Long Answer Type Questions

(5 marks each)

- Q.1. Mention the organ and site of photosynthesis in green plants. What are the raw materials essential for this process ? How are they obtained ? Write complete balanced chemical equation for the process. Name the byproducts.

[Board Term I, Set-NS9SX1D, 2016]

- Ans. (i) Photosynthesis takes place in the grana and stroma of the chloroplast (Plastid) in green plants.  
 (ii) The raw materials required for this process are carbon dioxide and water in the presence of sunlight and chlorophyll.  
 (iii) Carbon dioxide enters into the leaves through stomata and cells of the roots absorb water from the soil.  
 (iv) Balanced equation for photosynthesis —  

$$6\text{CO}_2 + 6\text{H}_2\text{O} \xrightarrow[\text{Sunlight}]{\text{Chlorophyll}} \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$$
  
 (v) The byproducts in this process is the evolution of oxygen gas. 1 + 1 + 1 + 1 + 1

- Q.2. (a) State the form in which the following are stored :

- (i) Unused carbohydrates in plants  
 (ii) The energy derived from food in humans.

- (b) Describe the process of nutrition in *Amoeba* with the help of diagram.

[NCERT]

- (c) How does paramecium obtain its food ?

[DDE-2014]

[Board Term I, Set-IN14KGB 2014; 2012]

Ans. (a) (i) Starch (ii) ATP

(b)

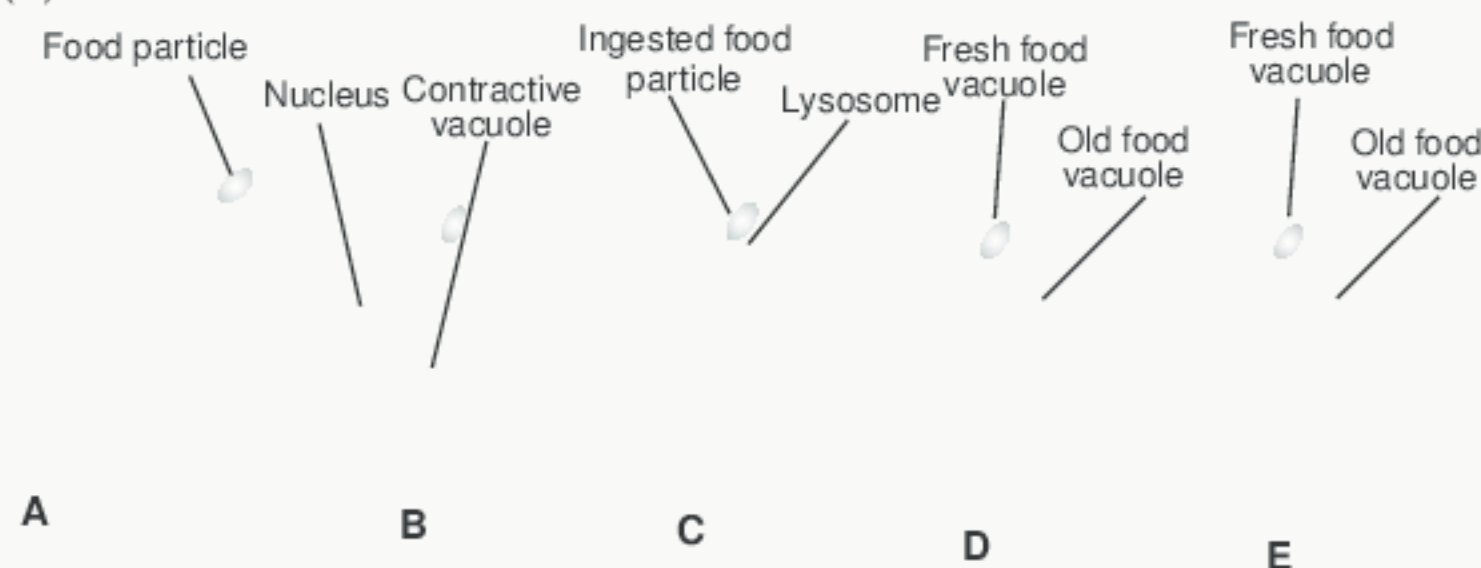


Fig. Holozoic nutrition in *Amoeba*

Protozoans like *Amoeba* capture food with the help of temporary finger-like processes called pseudopodia.

As soon as *Amoeba* comes in contact with a food particle or prey, it throws pseudopodia all around the food particle. The tips of encircling pseudopodia fuse and the prey comes to lie in a vesicle or phagosome. This method of intake of food is called circumvallation. *Amoeba* can also ingest food by other methods like import circumfluence and invagination.

- (c) In paramecium, the food is taken in at a specific spot and is moved to this spot by the movement of cilia which cover the entire surface of the cell.

[CBSE Marking Scheme, 2014] 1 + 3 + 1

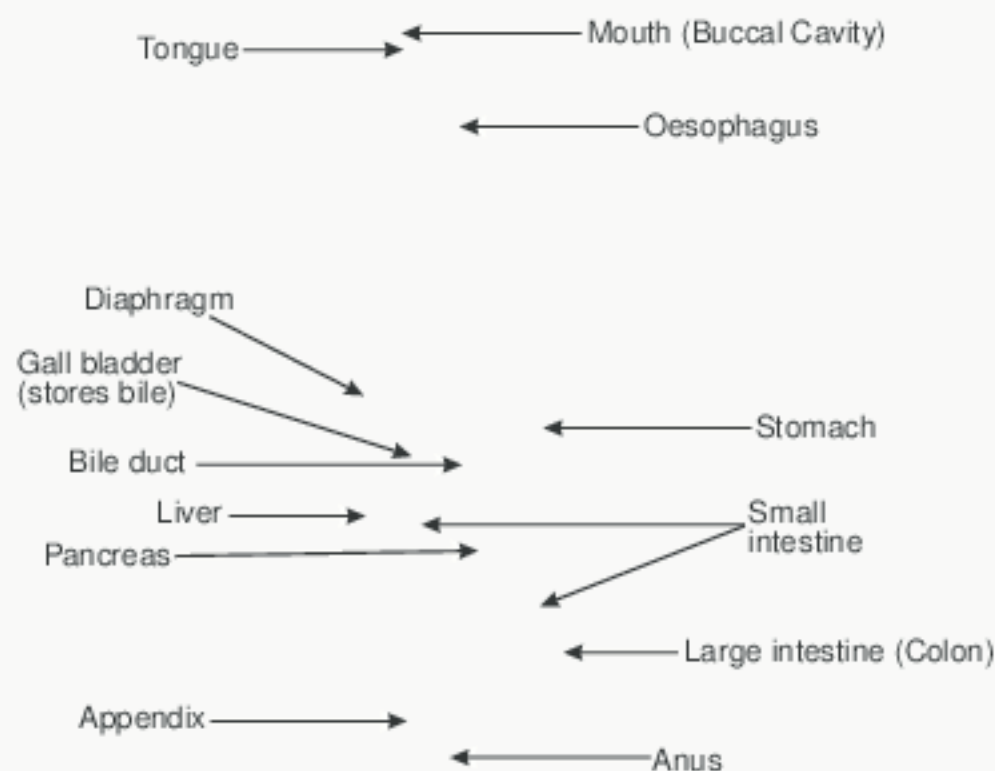
- Q.3. (a) Draw a well labelled diagram of human alimentary canal, and label the following parts :

- (i) Liver  
 (ii) Pancreas  
 (iii) Small intestine  
 (iv) Large intestine.

- (b) What is peristaltic movement ?

[DDE-2014] [Board Term I, Set-45, 2012]

Ans.(a)



2 marks for diagram + 2 marks for labelling = 4

- (b) **Peristaltic movement :** The lining of alimentary canal has muscles that contract rhythmically in order to push the food forward. This is called peristaltic movements. [CBSE Marking Scheme, 2012] 1

## TOPIC-2

### Respiration

#### Very Short Answer Type Questions

(1 mark each)

- [R] Q.1. Define breathing.

Ans. A physical process by which oxygen is taken in and carbon dioxide is given out is called breathing. 1

- [R] Q.2. What is the principle of exchange of gases ?

Ans. Diffusion is the principle of exchange of gases. 1

- [R] Q.3. How do plants utilise the  $\text{CO}_2$  produced during respiration ?

Ans. Plants perform photosynthesis for utilising  $\text{CO}_2$ . 1

- [R] Q.4. Name the respiratory pigment in human beings. Where is this pigment found ?

[Board Term I, Set-WH1SGOB, 2014]

Ans. The respiratory pigment in human being is haemoglobin. Haemoglobin is present in RBC's of blood in humans.  $\frac{1}{2} + \frac{1}{2}$

- [R] Q.5. Where does aerobic respiration occur in a cell ?

[Board Term I, Set-3R6WRQL, 2013]

Ans. Aerobic respiration occurs in mitochondria of the cell. 1

#### Short Answer Type Questions-I

(2 marks each)

- [A] Q.1. Write the equation for the process of breakdown of glucose in a cell :—

(a) in the presence of Oxygen

(b) in the absence of Oxygen [DDE 2017]

Ans. (a)  $\text{C}_6\text{H}_{12}\text{O}_6 \xrightarrow{\text{Presence of Oxygen}} \text{CO}_2 + \text{H}_2\text{O} + \text{Energy}$

(b)  $\text{C}_6\text{H}_{12}\text{O}_6 + \text{O}_2 \xrightarrow{\text{Absence of Oxygen}} \text{C}_2\text{H}_5\text{OH} + \text{CO}_2 + \text{Energy}$   
(Ethanol) 1 + 1

- [U] Q.2. Write the differences between inhalation and exhalation. [DDE 2017]

Ans.

Inhalation	Exhalation
During inhalation the thoracic cavity (chest cavity) expands.	Thoracic cavity contracts.
Ribs lift up.	Ribs move downwards.
Diaphragm become flat in shape.	Diaphragm becomes dome shaped.
Volume of lungs increases and air enters the lungs	Volume of lungs decreases and air exits from the lungs.

 $\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2}$



U Q.3. Explain the cause of cramps after excessive physical exercise. [DDE 2017]

Ans. During strenuous exercise, our body requires instant energy and it is fulfilled through anaerobic respiration. Muscle cells break down glucose to produce lactic acid and energy. A lot of lactic acid gets accumulated in our muscles and this causes muscle cramps. 2

U Q.4. How are the alveoli designed to maximise the exchange of gases? [NCERT 2017]

Ans. The alveoli are adapted to make gas exchange in lungs efficiently. They give the lungs a really big surface area, they have moist, thin walls and they have a lot of tiny blood vessels called Capillaries. Air is sucked into the lungs and alveoli. When we breathe in the alveoli expand, and maximise the exchange of gases. 2

U Q.5. What is the benefit of residual volume of air in the respiratory process? [DDE 2017]

Ans. It prevents our lungs to get burst out. It also prevents sticking of lung walls and provides nourishment to inner lungs during exhalation. 2

A Q.6. "Respiration is an Exothermic Reaction." Justify this statement giving the chemical equation for the reaction involved. [Board Term I, Set (14), 2011]

Ans. During respiration, the carbohydrates are broken down to form glucose. This glucose combines with oxygen in our cells and provides energy (heat). 1



U Q.7. When a sportsman runs, he often gets muscle cramps. Why? [Board Term I, Set-44, 2011]

Ans. In order to release more energy to perform sudden activity, pyruvate is converted into lactic acid in the lack of oxygen. Formation of lactic acid in muscles causes cramps or fatigue. 2

U Q.8. Stomata of desert plants remain closed during day time. How do they take up  $CO_2$  and perform photosynthesis?

[Board Term I, Set (11), 2012; Set (C2) 2010]

Ans. Desert plants take up  $CO_2$  at night and prepare an intermediate molecule. The intermediate molecule is acted upon by the energy and absorbed by the chlorophyll during day. 1 + 1

U Q.9. How do guard cells regulate opening and closing of stomatal pores?

[Board Term I, Set (C1), 2010]

Ans. The swelling of guard cells due to absorption of water causes opening of stomatal pores while shrinking of guard cell closes the pores. Opening and closing of stomata occur due to turgor changes in guard cells. When guard cells are turgid, stomatal pores are open while in flaccid conditions the stomatal aperture closes. 2

A Q.10. Leaves of a healthy potted plant were coated with vaseline. Will this plant remain healthy for long? Give reasons for your answer.

[Board Term I, Set (35) 2011; 2010]

[NCERT Exemplar 2017]

Ans. This plant will not remain healthy for a long time because :

- (i) It will not get oxygen for respiration.
- (ii) It will not get carbon dioxide for photosynthesis.
- (iii) Upward movement of water and minerals would be hampered due to lack of transpiration.

(Any two) 1 + 1

U Q.11. Give reasons for the following :

(i) Why is diffusion not sufficient to meet the oxygen requirements of all the cells in multicellular organisms?

(ii) How do desert plants perform photosynthesis if their stomata remain closed during the day?

[Board Term I, Set-23, 2011]

Ans. (i) All the cells in multicellular organisms may not be in direct contact with the surrounding environment. Thus, simple diffusion will not meet the  $O_2$  requirements of all the cells. 1

(ii) Desert plants take up carbon dioxide at night and prepare an intermediate compound which is acted upon by the energy and absorbed by the chlorophyll during the day. 1

## Short Answer Type Questions-II

(3 marks each)

R Q.1. Define breathing. Explain the mechanism of breathing in human beings.

[Board Term I, Set-WDCXXOV, 2016]

Ans. Breathing is the process of letting in oxygen from air into the lungs and  $CO_2$  out of the lungs.

**Mechanism :** Involuntary, rate controlled by brain. Outward and inward movement of ribs increases or decreases the space of thoracic cavity, action assisted by diaphragm continuous inhalation and exhalation of the air.

[CBSE Marking Scheme, 2016]

**Detailed Answer :** A physical process by which oxygen is taken in and carbon dioxide is given out is called breathing.

Breathing in humans involves three steps :

(i) **Inspiration :** When we breathe in, ribs move up and flatten the diaphragm due to which the chest cavity becomes larger. As a result air is sucked into the lungs and fills the expanded alveoli.

(ii) **Gaseous exchange :** Haemoglobin binds with the oxygen and carries it along the blood in the body. As blood passes through the tissues of the body, oxygen from the blood diffuses into the cell, whereas carbon dioxide which is produced during

respiration diffuses into the blood and is carried to the lungs for expiration.

- (iii) **Expiration** : Ribs move down and diaphragm becomes dome-shaped decreasing the chest cavity. Thus, pushing the air out from lungs. 3

**Q.2. Explain the activity with diagram to show that carbon dioxide is essential for photosynthesis.**

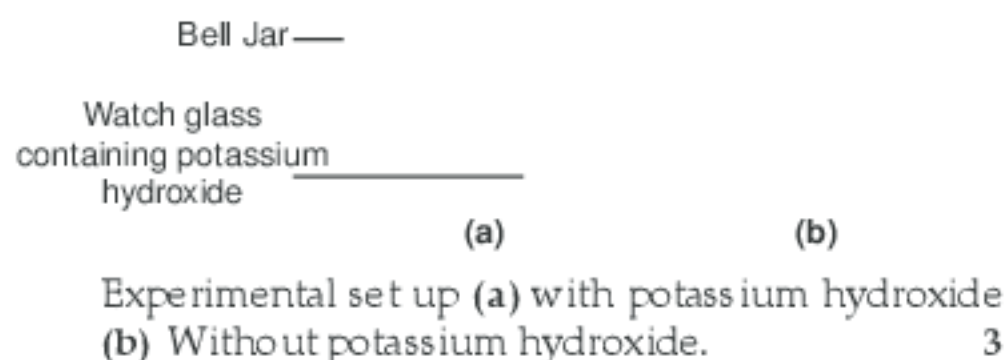
[Board Term-I, Set-A85V2IL, 2015]

**Ans. (i)** Take two healthy potted plants which are nearly the same size.

(ii) Keep them in a dark room for three days.

(iii) Now place each plant on separate glass plates. Place a watch glass containing potassium hydroxide

by the side of one of the plants. The potassium hydroxide is used to absorb carbon dioxide.

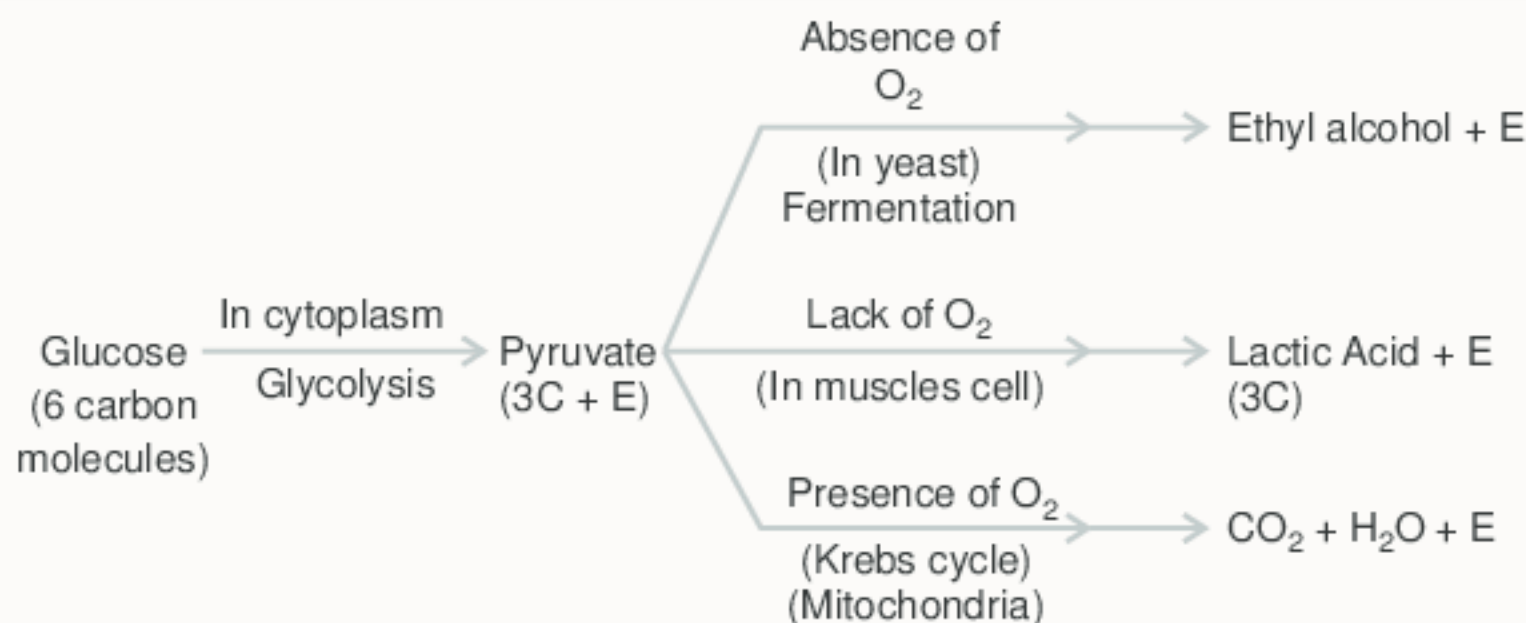


**Q.3. With the help of a schematic flow chart, show the break down of glucose in a cell to provide energy :**

- (i) in the presence of oxygen  
(ii) in the absence of oxygen  
(iii) when there is lack of oxygen.

[NCERT] [Board Term I, Set-43, 2012]

**Ans.**



[CBSE Marking Scheme, 2012] 3

**Q.4. List three characteristics of lungs which make it an efficient respiratory surface.**

[Board Term I, Set-51, 2012]

- Ans. (i)** It has large surface area and branched. 1  
(ii) Contain an extensive network of blood vessels. 1  
(iii) It is thin, delicate and fine. 1

[CBSE Marking Scheme, 2012]

**Q.5. List in tabular form the two differences between aerobic and anaerobic respiration. Why do we feel cramps in our muscles during sudden physical activity ?**

[NCT - 2014] [DDE - 2014] [NCERT 2017]

**Ans.** Difference between Aerobic and Anaerobic respiration :

S. No.	Aerobic Respiration	Anaerobic Respiration
(i)	Occurs in the presence of oxygen.	Occurs in the absence of oxygen.
(ii)	Releases large amount of energy.	Releases relatively small amount of energy.

During sudden physical activity, there is a lack of oxygen in our muscles cells, the pathway for

the breakdown of pyruvate into lactic acid that develops cramps in the body. 2 + 1

**Q.6. How is carbon dioxide and oxygen transported in human being ?** [NCERT]

**Ans.** When we inhale air, oxygen reaches the alveoli in lungs. Thin capillaries surround alveoli. These alveoli carry blood in them. The oxygen diffuses from the alveoli walls to the blood in capillaries. This blood travel all through the body. Haemoglobin binds with oxygen and carry it along the body. The  $O_2$  is present in the blood diffuses into the cells since the blood contain high concentration of oxygen while cells contain low concentration of oxygen.

$CO_2$  is produced as a waste product in respiration in the cells of tissues. This  $CO_2$  diffuses into the blood as the concentration of  $CO_2$  is low in blood. Blood carries  $CO_2$  back to lungs, where it diffuses into alveoli, then trachea, nostrils and then out of the body into air.  $CO_2$  is transported in dissolved form in our blood. 3

**Q.7. The rate of breathing in aquatic organisms is much faster than that seen in terrestrial organisms. Give reason.**

[Board Term I, Set-5X7289R, 2014] [DDE 2017]



**Ans.** A terrestrial organism can obtain oxygen directly from the air and have slow breathing rate but aquatic organisms have to obtain oxygen for respiration which is dissolved in water. Since, the amount of oxygen dissolved in water is fairly low as compared to the amount of oxygen in air the rate of breathing in aquatic organism is much faster. 3

**Q.8.** Give reasons for :

- (i) Oxygenated and deoxygenated bloods are separate in the heart of mammals.
- (ii) Ventricles are thick walled.

(iii) Herbivores have longer small intestine as compared to carnivores.

[Board Term I, Set-51, 2012]

**Ans. (i)** This allows a highly efficient supply of oxygen, and meet their high energy needs (as they are warm-blooded animals). 1

(ii) Because they have to pump blood throughout the body or into various organs. 1

(iii) To allow cellulose to be digested. 1

[CBSE Marking Scheme, 2012]

## Long Answer Type Questions

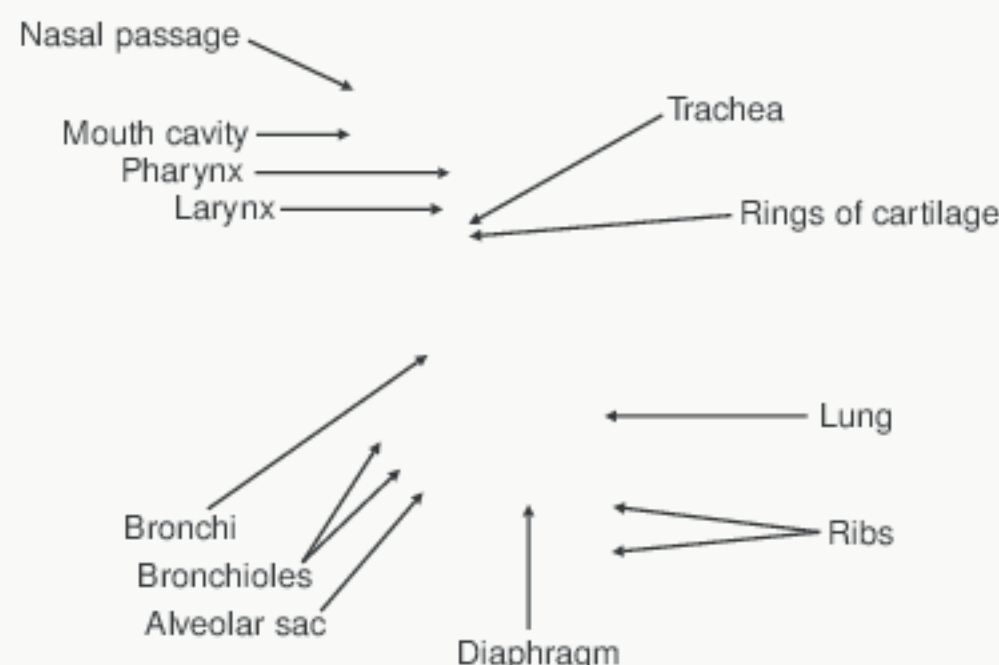
(5 marks each)

**Q.1.** (i) Draw the human respiratory system and label the following—lung, bronchi and alveolar sac.

(ii) During breathing cycle, what is the advantage of residual volume of air in lungs ? Explain.

[Board Term I, Set-15, 2012] [DDE 2017]

**Ans. (i)**



4

(ii) So that there is sufficient time for oxygen to be absorbed and for  $\text{CO}_2$  to be released. 1

[CBSE Marking Scheme, 2012]

**Q.2.** Draw a diagram of human respiratory system and label the following :

- (i) part where air is filtered by fine hair and mucus.
- (ii) part which terminates in balloon-like structures.
- (iii) balloon-like structures where exchange of gases takes place.
- (iv) part which separates chest cavity from abdominal cavity.

**Ans.** See diagram Ans. 1 (Long questions) Pg. 143 3

(i) Nasal passage

(ii) Bronchioles

(iii) Alveoli

(iv) Diaphragm. 2

**Q.3.** What are differences between aerobic and anaerobic respiration ? Name some organisms that use the anaerobic mode of respiration ?

[NCERT]

**Ans.**

S. No.	Aerobic Respiration	Anaerobic Respiration
(i)	Aerobic respiration takes place in the presence of oxygen.	Anaerobic respiration takes place in the absence of oxygen.
(ii)	Complete breakdown of food occurs in this process.	Partial or incomplete breakdown of food occurs in the process.
(iii)	The end products are carbon dioxide ( $\text{CO}_2$ ) and water ( $\text{H}_2\text{O}$ ).	The end products may be ethyl alcohol, $\text{CO}_2$ or lactic acid.
(iv)	It produces a considerable amount of energy due to complete oxidation of food.	Much less energy is produced due to incomplete oxidation of food.

Organism that use the anaerobic mode of respiration are yeast, some bacteria and some parasite. 4 + 1

**Q.4.** (i) Draw the diagram of cross section of a leaf and label the following parts :

(a) chloroplast (b) cuticle

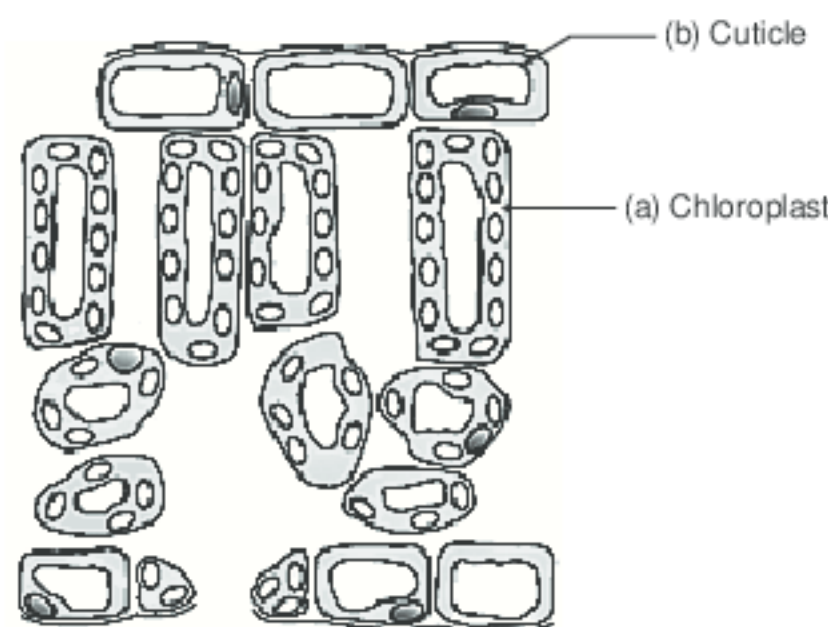
(ii) A gas is released during photosynthesis. Name the gas and also state the way in which the gas is evolved.

(iii) In certain group of plants, stomata remains closed during day. How is food synthesized by such plants ? Also name them.

[Board Term I, Set-46, 2012]

Ans. (i)

2



(ii) Oxygen 1/2

By splitting of water  $2\text{H}_2\text{O} \xrightarrow{\text{splits}} \text{H}_2 + \text{O}_2$  2

(iii) They take up  $\text{CO}_2$  at night and prepare an intermediate which is acted upon by the energy absorbed by chlorophyll during the day. 1 1/2

1. Desert plants. [Xerophytic plants] 1

## TOPIC-3

### Circulation and Transportation

#### Very Short Answer Type Questions

(1 mark each)

**Q.1.** Name the largest artery in the human body.

Ans. The largest artery in the human body is Aorta. 1

**Q.2.** Why is the walls of ventricles thicker than the walls of atria ?

Ans. Ventricles have to pump blood into various organs. So, they have thicker walls than the walls of atria. 1

**Q.3.** Name the tissues which (i) transport soluble products of photosynthesis in plants, (ii) transport water and minerals in a plant.

[Board Term I, 2014]

Ans. (i) Phloem (ii) Xylem. 1/2 + 1/2

**Q.4.** What process in plants is known as transpiration ?

[Board Term I, 2010]

Ans. It is the loss of water in the vapour form from the exposed parts of a plant. 1

**Q.5.** What is transported by lymph ?

Ans. Lymph carries digested and absorbed fat from intestine. 1

**Q.6.** Name the component of blood which transport :

(i) Food, carbon dioxide and nitrogenous wastes

(ii) Oxygen. [Board Term I, Set-NS9SX1D, 2016]

Ans. (i) Plasma

(ii) Haemoglobin present in RBCs. 1/2 + 1/2

**Q.7.** Name the process of loss of water in the form of vapour from the aerial parts of the plants.

[Board Term I, Set-WDCXXOV, 2016]

Ans. Transpiration [CBSE Marking Scheme 2016] 1

#### Short Answer Type Questions-I

(2 marks each)

**Q.1.** What is the advantage of a four chambered heart in humans? [KVS 2017]

Ans. The four-chambered heart allows us to send our deoxygenated blood to the the lungs and our clean blood to the rest of the body without mixing the two. The blood coming from the left side of the heart is oxygenated and ready to fuel the muscles. The blood coming to the right side of the heart is collected from all over the body is deoxygenated and carried towards the lungs for oxygenation. 2

**Q.2.** Why is blood circulation in human heart called double circulation? [NCERT Exemplar 2017]

Ans. The blood circulation in human heart is called double circulation because the blood passes through the heart twice in one complete cycle of the body—once through the right half in the form of deoxygenated blood and once through the left half in the form of oxygenated blood. 2

**Q.3.** Why do Veins have thin walls as compared to arteries? [NCERT Exemplar 2017]



**Ans.** The walls of the arteries are found to be thicker than that of a Vein because the blood that is carried from the heart to the capillaries has more high pressure. As the blood flowing through the veins does not have much pressure as in that of the arteries their walls are thinner as compared to artery walls. 2

**Q. 4. Differentiate between blood and Lymph.** [KVS 2017]

**Ans.**

S. No.	BLOOD	LYMPH
(i)	Blood is pumped throughout the body by the heart.	Lymph is moved along through the normal function of the body
(ii)	Blood contains red blood cells, white blood cells and platelets.	Lymph is a whitish and clear liquid in which RBCs are absent

1 + 1

**Q. 5. How is the process of transpiration useful to plants?** [Board Term I, Set-38, 2011; Set-B2, 2010]

**Ans.** (i) Upward movement of sap or water from roots to leaves.

(ii) Regulates temperature.

(iii) Under optimal condition, leaf can transpire its own weight of water in less than an hour.

(iv) Phloem tissues helps in transport of food.

(v) Food is transported in both upward and downward directions.

(vi) Transport of food in phloem required energy in the form of ATP. (Any two) 1 + 1

**Q. 6. State the difference between transport of materials in xylem and phloem.** [NCERT] [Board Term I, Set-WH15GOB-2014] OR

**Explain how water and minerals are transported in plants?** [Board Term I, Set 2ZGOVVV, 2015]

**Ans. Transport of materials in Xylem :**

(i) Xylem tissues helps in transport of water and minerals.

(ii) Water is transported upwards from roots to aerial parts of plants.

(iii) Transport in xylem requires physical forces such as transpiration pull.

**Transport of materials in Phloem :**

(i) Phloem tissues helps in transport of food

(ii) Food is transported in both upward and downward directions

(iii) Transport of food in phloem requires energy in the form of ATP 1 + 1

**Q. 7. Name the material transported by the following :**

(i) Xylem.

(ii) Pulmonary artery.

(iii) Pulmonary veins.

(iv) Phloem. [Board Term I, Set (15), 2011]

**Ans.** (i) Xylem : Transport water and minerals in plants. ½

(ii) Pulmonary artery : Transport deoxygenated blood from heart to lungs. ½

(iii) Pulmonary veins : Transport oxygenated blood from lungs to heart. ½

(iv) Phloem : Transport synthesised food in plants. ½

**Q. 8. Which mechanism plays an important role in transportation of water in plants ?**

(i) during day time,

(ii) at night. [Board Term I, Set (20), 2011]

**Ans.** (i) Transpirational pull.

(ii) Root pressure. 1 + 1

**Q. 9. What is translocation ? How it take place in plants ?** [Board Term I, Set (24), 2011]

**Ans.** Transport of soluble product of photosynthesis or food from leaves to other parts of plants is called translocation.

For translocation, food molecules enter the part of the phloem called the sieve tubes where they can be transported upwards or downwards to all the parts of the plant including roots.

Translocation is achieved by utilising energy from the ATP that provides osmotic pressure required for upward and downward movement of food. 2

**Q. 10. State any two differences between arteries and veins.** [Board Term I, Set (28), 2011] [KVS 2017]

**Ans. Differences between arteries and veins :**

S. No.	Arteries	Veins
(i)	They are thick walled.	They are thin walled.
(ii)	Arteries have no valves.	They have valves.
(iii)	Carry oxygenated blood except pulmonary artery.	Carry deoxygenated blood except pulmonary vein.

(Any two) 1 + 1

**Q. 11. Why is it necessary to separate oxygenated and deoxygenated blood by mammals and birds ?**

[NCERT]

**Ans.** Mammals and birds are warm-blooded animals. They constantly use energy to maintain their body temperature. They have higher energy needs and so they require more oxygen to produce energy. Thus, it is important that their oxygenated blood does not get mixed up with deoxygenated blood. 2

## Short Answer Type Questions-II

(3 marks each)

**Q. 1. Define transpiration. State its two functions.**

[Board Term I, Set (40), 2012]

**Ans.** The loss of water in the form of vapour from the aerial parts of the plants is known as transpiration. 1

**Functions :**

(i) It helps in the absorption and upward movement of water and mineral dissolved in it from roots to the leaves. 1

(ii) It also helps in temperature regulation. 1 [CBSE Marking Scheme, 2012]

**Q.2. (a) How does the transport of materials in xylem and phloem occurs ?**

**(b) What is translocation ?**

[Board Term I, Set-W]7QPA9, 2013]

**Ans. (a) Xylem :**

- (i) Transport of water and mineral.
- (ii) Upward movement. (Unidirectional)

**Phloem :**

- (i) Transport of food and hormones.
- (ii) Upward and downward movements (bidirectional).

**(b) Transport of soluble food by phloem is called translocation.**

1 + 1 + 1

[CBSE Marking Scheme, 2013]

**Q.3. Write three points of differences between artery and vein. [Board Term I, Set-WDCXX0V, 2016]**

**Ans.**

S. No.	Artery	Vein
(i)	Wall is thick.	Wall is thin.
(ii)	Valves absent.	Valves present.
(iii)	Blood flows from heart to different organs.	Blood flows from different organs to heart.
(iv)	The flow of blood is fast, jerky and with great pressure.	The flow of blood is slow, steady and with less pressure

(Any three) [CBSE Marking Scheme, 2016]

1 + 1 + 1

**Q.4. Give reasons for the following—**

- (a) Arteries are thick walled blood Vessel.
- (b) Veins are thin walled blood Vessel
- (c) Veins have valves in them.

[NCERT Exemplar 2017]

**Ans. (a)** Thick walls of arteries help them to resist the pressure of flow of blood in them. Arteries are elastic so as to produce enough pressure to push the blood and help it flow.

**(b)** Veins have thin walls because veins collect the blood from different organs and bring it back to the heart. The blood is no longer under pressure and blood flows only in one direction.

**(c)** Main function of valve is to prevent back flow of blood. Since the blood pressure in veins is very low they have valves that prevent back flow of blood.

1 + 1 + 1

**Q.5. (a) What is lymph ?**

**(b) How is composition of lymph different from blood plasma ?**

**(c) List two functions of lymphatic system.**

[Board Term I, Set (50), 2012]

**Ans. (a)** Lymph a colourless fluid containing white blood cells.

1

**(b)** Lymph is colourless and contains less protein than plasma.

1

**(c) Functions :**

- (i) Carry digested fat/absorption of fat.  $\frac{1}{2}$
- (ii) Drains excess fluid from extracellular space back into the blood.  $\frac{1}{2}$

[CBSE Marking Scheme, 2012]

**Q.6. Explain :**

**(i) Blood goes only once through the heart in fishes.**

**(ii) Plants have low energy needs.**

**(iii) What are capillaries ?**

[DDE-2014, Board Term I Set-54, 2012]

**Ans. (i)** Because they do not maintain their own body temperature, therefore they do not require separation of oxygenated and deoxygenated blood.

1

**(ii)** Because plant bodies have a large proportion of dead cells.

1

**(iii)** Capillaries are smallest vessels which have one cell thick wall. The exchange of material between the blood and the surroundings take place through capillaries.

1

[CBSE Marking Scheme, 2012]

**Q.7. (i) Mention the site of exchange of material between the blood and surrounding cells.**

**(ii) Draw a schematic representation of transport and exchange of oxygen and carbon dioxide.**

[Board Term I, Set-L72SVLH, 2016]

**Ans. (i) Capillaries**

**(ii) Refer to below fig.**

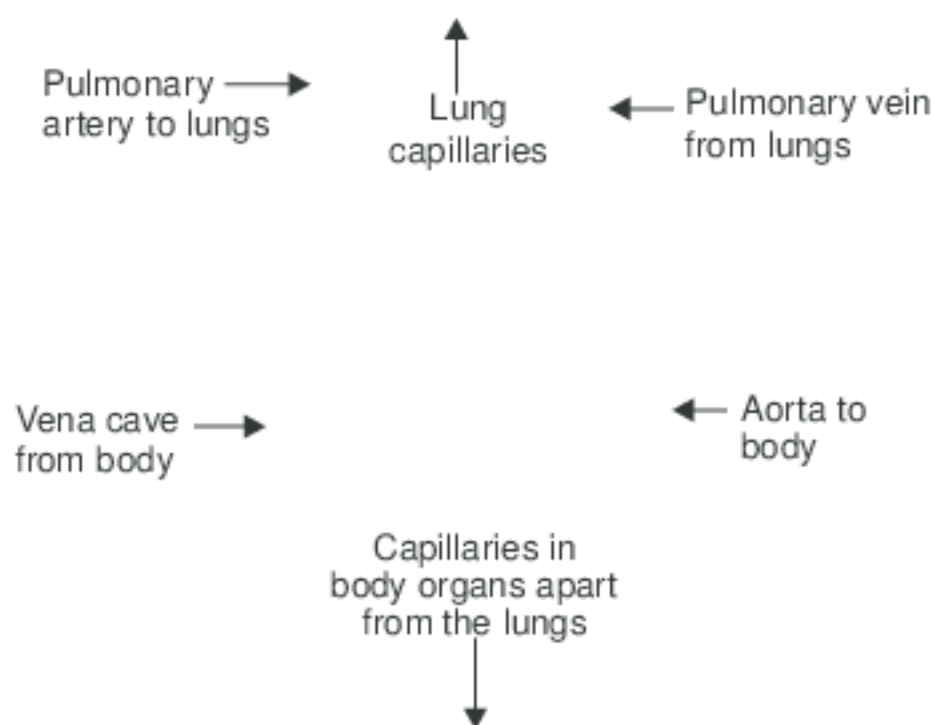
3

[CBSE Marking Scheme, 2016]

**Detailed Answer :**

**(i) Capillaries.**

**(ii) Schematic representation of transport and exchange of oxygen and carbon dioxide.**



1 + 2

**Schematic representation of transport and exchange of oxygen and carbon dioxide**

**Q.8. Describe the process of double circulation in human beings.**

[NCERT Exemplar 2017] [NCERT]



**Ans.** Double circulation has two components—Pulmonary circulation and systemic circulation.

Pulmonary circulation is movement of blood from heart to the lungs and back from the lungs to the heart. Deoxygenated blood of the body enters the right auricle, passes into right ventricle which pumps it into pulmonary arch, two separate pulmonary arteries the blood passes into the lungs. Now Oxygenated blood from the lungs is carried back to the heart by : Pulmonary veins and enters into the left auricle of the heart. Systemic Circulation is the circulation of blood between heart and different parts of the body except lungs. Oxygenated blood received by left auricle passes into left ventricle. The left ventricle pumps it into aorta for supply to different body parts including walls of the heart with the help of arteries.  $\frac{1}{2} + \frac{1}{2}$

**Q.9.** What would be the consequences of a deficiency of haemoglobin in our bodies ? [NCERT]

**Ans.** Haemoglobin efficiently binds with oxygen and then it transports oxygen to various parts of body. Deficiency of haemoglobin is referred to as anaemia. In such a condition, the blood is unable to carry the sufficient amount of oxygen required by the body. This would cause less respiration and less energy will be liberated. In anaemia, the person feels weak, pale, lethargic and unable to perform heavy physical work. 3

**Q.10.** List the three kinds of blood vessels of human circulatory system and write their functions in tabular form. [Board Term I Set-36, 2012]

**Ans.**

S. No.	Blood Vessels	Function
(i)	Arteries	They carry blood away from the heart to various organs of the body.

(ii)	Veins	They collect blood from different organs and bring it back to the heart.
(iii)	Capillaries	Exchange of material between the blood and surrounding cells takes place across the thin walls of capillaries.

[CBSE Marking Scheme, 2012] 1 + 1 + 1

**Q.11.** (i) Why do ventricles have thicker, muscular walls than atria ?

(ii) What are peristaltic movements ?

(iii) 'Stomata remain closed in desert plants during day time.' How do they do photosynthesis ?

[Board Term I, Set-42, 2012]

**Ans.** (i) Since ventricles have to pump blood into various organs, they have thicker muscular walls than atria do. 1

(ii) The lining of alimentary canal has muscles that contract rhythmically in order to push the food forward. These are peristaltic movements. 1

(iii) In desert plant, stomata open at night and absorb  $\text{CO}_2$ , and store it as an intermediate compound, that is converted into carbohydrate during the day time. 1

[CBSE Marking Scheme, 2012]

**Q.12.** Plants absorb water from the soil. Explain how does the water reach the tree top ?

[Board Term I, Set-JYNE6XG, 2015  
Board Term I, Set-IN14KGB, 2014]

**Ans.** Xylem (vessels) of roots, stems and leaves are interconnected to form a continuous column. Roots also take up mineral salts actively, water moves in and as a result, creating pressure which pushes the water up. Transpiration pull creates a suction force pulling up water. 3

[CBSE Marking Scheme, 2014]

## Long Answer Type Questions

(5 marks each)

**Q.1.** (a) Draw a diagram of cross-section of the human heart and label the following parts :

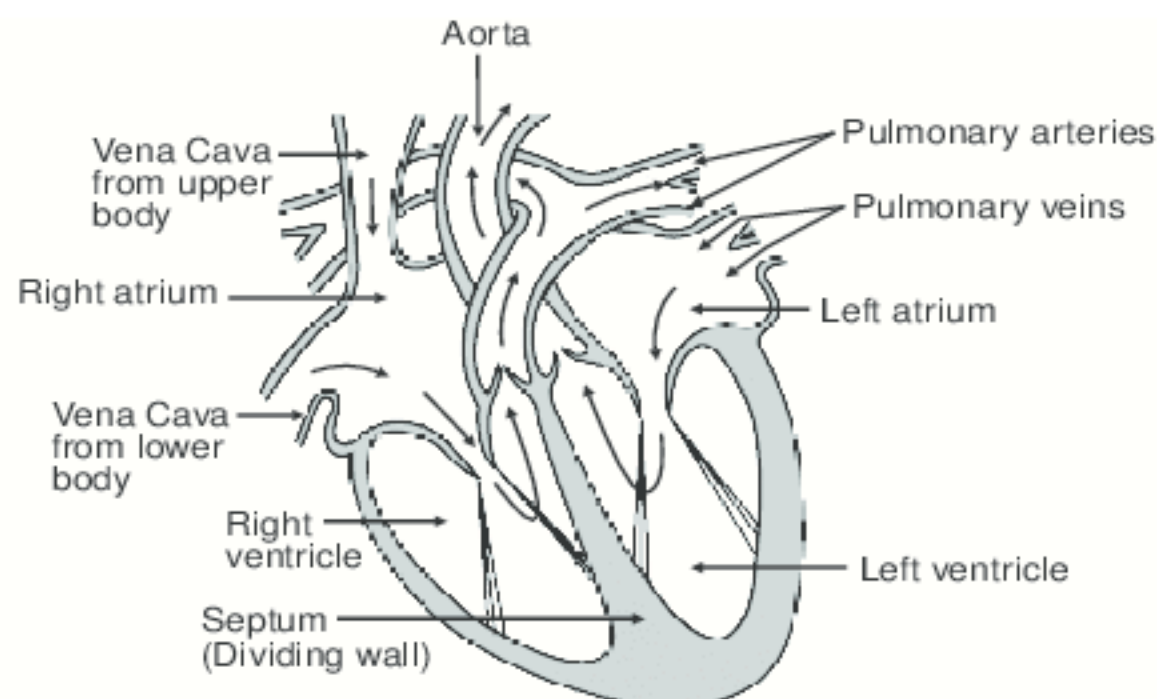
- (i) Right ventricle
- (ii) Aorta
- (iii) Left atrium
- (iv) Pulmonary arteries.

(b) Give reasons for the following :

- (i) The muscular walls of ventricles are thicker than the walls of atria.
- (ii) Arteries have thick elastic walls.

[DDE-2014, Board Term I, Set-WJ7/QPA9, 2013]

Ans. (a)



4

(b) (i) As ventricle have to pump blood into various organs.

(ii) Since the blood emerges from the heart under high pressure.

1

**Q.2. (a) State two advantages of transpiration to the plant body.**

(b) (i) List in tabular form, two ways in which 'transpiration' is different from 'translocation.'

(ii) Why do plants have a slow transport system ?

[Board Term I, Set-48, 2012]

[NCERT Exemplar 2017]

(b) (i)

S. No.	Transpiration	Translocation
(i)	Plays role in transport of water and minerals	It is a transport of soluble products of photosynthesis.
(ii)	Occurs through xylem by simple physical forces.	Occurs through phloem in the form of sucrose by utilising energy.

2

Ans. (a) Two advantages :

(i) Helps in absorption and upward movement of water and minerals from roots to the leaves. 1

(ii) Temperature regulation. 1

(ii) Because plants have a large proportion of dead cells in many tissues, they have low energy needs. So they use a slow transport system. 1

## TOPIC-4

### Excretion

### Very Short Answer Type Questions

(1 mark each)

**Q.1. What is osmoregulation ?**

Ans. Osmoregulation is the maintenance of optimum concentration of water and salts in the body fluids. 1

**Q.2. Which organ synthesises urea ?**

Ans. Liver synthesises urea. 1

**Q.3. Why ammonia is converted to uric acid crystals directly in uricotelic organisms ?**

Ans. Animals, which live in dry conditions have to conserve water in their bodies. Therefore, they synthesise crystals of uric acid from their

ammonia. 1

**Q.4. Mention the respiratory unit of lungs and excretory unit of kidneys.**

[Board Term I, Set-2ZGOVVV, 2015] [DDE 2017]

Ans. Respiratory unit of lungs — Alveoli

Excretory unit of kidneys — Nephrons  $\frac{1}{2} + \frac{1}{2}$

**Q.5. What causes the liquid part of blood to filter out from the glomerulus into the renal tubule ?**

Ans. High pressure causes the liquid part of blood to filter out from the glomerulus into the renal tubule. 1

### Short Answer Type Questions-I

(2 marks each)

**Q.1. What is excretion ? How do unicellular organisms remove their wastes ?**

[Board Term I, Set(13), 2011]

Ans. The biological process which involves the removal

of harmful metabolic wastes from the body is called excretion. 1

Unicellular organisms remove their waste by simple diffusion. 1



**U Q.2. Why is nitrogen considered an essential element? How do plants acquire nitrogen?**

[Board Term I, OQKPLGV, 2016]

**Ans.** Nitrogen is an essential element used in the synthesis of proteins and other compounds. It is taken up in the form of inorganic nitrates (or nitrites) or as organic compounds prepared by bacteria from atmospheric nitrogen. 2

**U Q.3. What are the methods used by plants to get rid of excretory products?** [NCERT 2017]

**Ans.** Plants use a variety of techniques to get rid of waste materials— Exchange of gases through stomata, waste material may be stored in the cell-vacuoles or as gum and resin, removed in the falling or excreted into the surrounding soil. 2

**U Q.4. How water enter continuously into the root xylem?** [NCERT Exemplar 2017]

**Ans.** Water enters into the root xylem by the process of diffusion through root hairs. During photosynthesis water is constantly evaporated, this creates a kind of suction from the cells of a which pulls up water through the xylem vessel. 2

**A Q.5. How do leaves in plants help in excretion?**

[NCERT Exemplar 2017]

**Ans.** Leaves of plants helps in excretion in many ways. Excess of water in plants is excreted by transpiration and guttation, that takes place through leaves. Carbon dioxide and oxygen that can be considered as waste products of respiration and photosynthesis respectively are excreted through stomata present on leaves. 2

**R Q.6. Write two major components of human urine.**

[Board Term I, Set (15), 2011]

**Ans.** The two major component of human urine are :  
(i) Urea, (ii) Uric acid. 1 + 1

**A Q.7. Major amount of water selectively reabsorbed by the tubular part of nephron in humans.**

What are the factors on which the amount of water reabsorbed depends ?

[Board Term I, Set (17), 2011]

**Ans.** It depends on the amount of:

- (i) Excess water is present in the body. 1
- (ii) Dissolved waste is to be excreted from the body. 1

**R Q.8. What is the function of the following :**

- (i) Renal artery, (ii) Renal Vein.

[Board Term I, Set-47, 2011]

**Ans. (i) Renal artery :** It brings the impure blood containing wastes substances into the kidney.

**(ii) Renal vein :** It carries away the pure blood from the kidney. 1 + 1

**U Q.9. List two major steps involved in the formation of urine and state in brief their functions.**

[Board Term I, Set-47, 2011]

**Ans. Filtration :** Nitrogenous waste such as urea or uric acid are removed from the blood (capillaries).

**Reabsorption :** Glucose, amino acids, salts and major amount of water are selectively reabsorbed. 1 + 1

**U Q.10. List any four strategies used by the plants for excretion.** [Board Term I, Set (34), 2011]

**Ans. Strategies used by plants for excretion are :**

- (i) They can get rid of excess water and oxygen through stomata.  $\frac{1}{2}$
- (ii) Many plant waste products are stored in cellular vacuoles.  $\frac{1}{2}$
- (iii) Waste products may be stored in leaves that fall off.  $\frac{1}{2}$
- (iv) Waste products are stored as resin and gums, especially in old xylem.  $\frac{1}{2}$

## Short Answer Type Questions-II

(3 marks each)

**U Q.1. List some important functions of kidney.**

**Ans. The main functions of kidneys are :**

- (i) Nephrons are the basic filtration unit of human beings. It removes poisonous substances such as urea and other salts along with excess water from the blood and urine that is excreted out from the body.
- (ii) It regulates the osmotic pressure / water balance of the blood.
- (iii) It regulates pH of the blood. 1 + 1 + 1

**U Q.2. What are the methods used by plants to get rid of excretory products ?** [NCERT]

**Ans.** Some of the methods employed by plants to get rid of excretory products are :

- (i) Gaseous wastes ( $\text{CO}_2$ , water vapour,  $\text{O}_2$ ) are removed through 'stomata' in leaves and 'lenticels' in stems and released into the air.
- (ii) Plants get rid of excess water by transpiration.

- (iii) Some waste products are stored as resins and gums. 1 + 1 + 1

**U Q.3. (i) What is the filtering unit of kidney ?**

**(ii) Why is it called so ?**

**Ans. (i)** Nephron is the filtering unit of kidney.

**(ii)** Nephron is called, so because it filters the blood and remove the poisonous nitrogenous waste like urea and uric acid, excess of water from it. These harmful products gets filtered and useful products are reabsorbed by tubular part of nephron. Thus, harmful waste is excreted out as urine from the body. 1 + 2

**U Q.4. Mention the pathway of urine starting from the organ of its formation. Name four substances which are reabsorbed from the initial filtrate in the tubular part of the nephron.**

[Board Term I, Set-K72SVLH, 2016]

**Ans.** Kidney → Ureters → Urinary bladder → Urethra  
Glucose, amino acids, salts and major amount of water. [CBSE Marking Scheme 2016]

**Detailed Answer :**

The pathway of urine starting from the organ of its formation is :

Kidney → Ureters → Urinary bladder → Urethra.

The four substances reabsorbed from initial filtrate are—

(i) Amino acid (ii) glucose (iii) salts (iv) major amount of water. 1 + 2

**Q.5.** Name one nitrogenous waste present in urine. What is the basic filtration unit of kidney called? How is the amount of urine produced regulated? [Board Term I, Set-NS9SX1D, 12HNPNO, 2016]

**Ans.** Nitrogenous waste present in urine is uric acid or Urea. The basic filtration unit of kidney is nephron.

Urine production is regulated by—

(i) amount of excess water in the body

(ii) amount of dissolved wastes that need to be excreted. 1 + 1 + 1

**Q.6.** (a) Name the following :

(i) The three carbon molecule that is formed due to break-down of glucose during respiration.

(ii) The nitrogenous waste that is removed from the blood in our kidneys.

(b) How do unicellular organisms generally remove waste?

**Ans.** (a) (i) The three carbon molecule formed due to break-down of glucose during respiration is pyruvate.

(ii) Urea.

(b) Unicellular organisms generally remove waste by the process of diffusion from the body surface into the surrounding water. 1 + 1 + 1

**Q.7.** Define excretion. Write two vital functions of kidney. [DDE-2015]

**Ans.** Refer to short Answer Type I Q.1 Pg. 147 and S.A. I Type II Q. 1. Pg. 147. 1+2

## Long Answer Type Questions

(5 marks each)

**Q.1.** (a) Draw a diagram of human excretory system and label the following parts on it :

- (i) Right Renal Artery (ii) Vena cava.  
(iii) Urinary bladder (iv) Left kidney  
(b) List two vital functions of kidney.

[Board Term I, Set-A85V2IL, 2015;  
Board Term I, Set-OQKPLGV, 2016]

**Ans. (a)**

Right renal artery \_\_\_\_\_  
Right kidney \_\_\_\_\_ Left kidney  
Vena cava \_\_\_\_\_ Ureter  
Urinary bladder

2

**(b) Vital functions of kidney :**

- (i) To regulate right amount of water in body.  
(ii) Helps in filtering out nitrogenous waste like urea from blood. 3

[CBSE Marking Scheme, 2016]

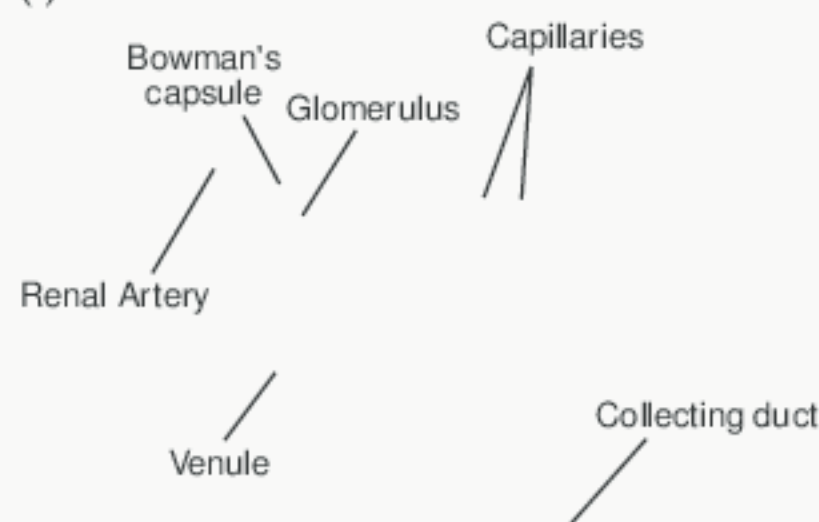
**Q.2.** (i) Draw a diagram of an excretory unit of a human kidney and label the following : Bowman's capsule, Glomerulus, Collecting duct, Renal artery.

(ii) Write the important function of the structural and functional unit of kidney.

(iii) Write any one function of an Artificial Kidney.

[Board Term I, Set-5X/289R, 2014]

**Ans. (i)**



3

### Urinerous tubule with its blood vessels

(ii) Function of nephron is filtration, reabsorption and secretion. 1

(iii) **Function of Artificial Kidney :** Helps to remove harmful wastes, extra salts and water, control blood pressure. Maintain the balance of sodium potassium salts in a patient whose kidneys have failed. (Any one) 1

[CBSE Marking Scheme, 2014]

**Q.3.** (a) Draw a diagram of human excretory system and label the following :



- (i) part in which urine is produced
  - (ii) part which stores the urine
  - (iii) part which connects (i) and (ii)
  - (iv) part from which urine is passed out.
- (b) Name the factors on which the amount of water reabsorbed along the tubular part of nephron depend on ? [Board Term I, Set (31), 2012]

**Ans.** (a) Refer diagram Ans. 1 Long questions Pg. 148. 2

- (i) Kidney
- (ii) Urinary bladder
- (iii) Ureter
- (iv) Urethra. 2

- (b) The amount of water reabsorbed depends on the quantity of excess water in the body and on the quantity of dissolved waste to be excreted. 1

[CBSE Marking Scheme, 2012]

**Q.4. Artificial kidney is a device to remove nitrogenous waste products from the blood through dialysis. In case of kidney failure, an artificial kidney can be used. Dialysis is the procedure used in artificial kidney to replace**

a non-functional or damaged kidney. In the process, blood of the patient is allowed to pass through the long cellulose tubes dipped in a tank containing dialysing solution having same ionic concentration as plasma. The waste substances diffuse out of blood into the tank and the cleansed blood is returned back into the patient through a vein.

(i) What is the unit of kidney ?

(ii) "Problems of heart that can be accelerated by bad kidney and vice-versa." Comment on this statement by giving reason.

(iii) What are the functions of kidney ?

**Ans.** (i) Nephron. 1

(ii) When kidney fails, toxins start pooling up and the functioning of heart automatically decreases. Heart disease is largely caused by irregular lipid levels, which also lead to kidney problems. 2

(iii) Functions :

(a) It helps in the ultrafiltration of urine.

(b) It regulates the osmotic pressure/water balance of the blood. 2

## High Order Thinking Skills (HOTS) Questions

**Q.1. In human, digestion starts in mouth. Which component of food breaks down in mouth ? What is the reason behind it ?** 3

**Ans.** Starch breaks down in mouth, salivary glands present in the mouth secrete saliva. Saliva contains an enzyme called salivary amylase that breaks down starch to give sugar (maltose). 3

**Q.2. Energy and food material are also required by plants. From where do plants fulfill these requirements ?** 3

**Ans.** Plants obtain energy and food material from inorganic sources in the form of carbon dioxide and water by the process of photosynthesis. During the process of photosynthesis, green plants take in carbon dioxide and water and convert them into carbohydrates and oxygen in the presence of light and chlorophyll. Carbohydrates are utilised for providing energy to the plant. 3

**Q.3. In a croton leaf, which areas of the leaf contains starch, green or yellow ? Give the reason for your answer.** 3

**Ans.** Green areas of croton leaf contain starch. Starch is formed during the process of photosynthesis which takes place in the presence of chlorophyll. Yellow areas of croton leaf do not contain chlorophyll hence unable to form starch. Green areas contain chlorophyll, hence produce starch. 3

**Q.4. (i) What prevents the entry of food into trachea while swallowing ?**

(ii) Why rate of breathing is faster in aquatic animals as compared to terrestrial animals ? 3

**Ans.** (i) Epiglottis : It covers the opening of wind pipe during swallowing.

(ii) Because the amount of dissolved  $O_2$  in water is less as compared to the air in atmosphere.  $1\frac{1}{2} + 1\frac{1}{2}$

**Q.5. How are the alveoli designed to maximise the exchange of gases ?** [NCERT] 3

**Ans.** (i) The alveoli are thin walled and richly supplied with a network of blood vessels to facilitate exchange of gases between blood and the air filled in alveoli.

(ii) Alveoli have balloon like structure. Thus, provide maximum surface for exchange of gases. 3

**Q.6. What constitutes one heart beat ? Is the pulse rate same as heart beat rate ?** 3

**Ans.** Heart beat is due to the rhythmic contraction and relaxation of heart muscles. One contraction (systole) and one relaxation (diastole) of heart constitute one heartbeat.

The pulse rate is same as heart beat rate. The rhythmic contraction of the heart is felt in certain areas like the wrist in the form of pulsations, and this is called pulse rate. 3

**Q.7. What is the need of four-chambered heart in mammals while fishes have only two-chambered heart ?** 3

**Ans.** Mammals need more energy to maintain their body temperature that's why they have four chambered heart. In the mammal heart, the oxygenated and deoxygenated blood is not allowed to mix, and this is achieved by the separation of the heart into right side and left side. Such a separation of heart provides an efficient method of supplying oxygen



to the body. Fish have two chambered heart and oxygenation of blood takes place in the gills and passes directly to the rest of the body. 3

**Q.8.** During summer season we drink a lot of water in comparison to winter, yet we pass urine fewer times in summer than in winter. What is the reason behind this fact? 3

**Ans.** During summer season, we lose a good amount of water through perspiration to keep our body temperature normal. While in winter, there is no perspiration. That is why, in summer season we drink a lot of water and pass urine fewer times. 3

**Q.9.** Do the freshwater animals reabsorb water through their excretory system like marine animals? Justify your answer. 3

**Ans.** The freshwater animals do not reabsorb water through their excretory system because in case of fresh water animals, large amount of water is taken up through their skin and mouth.  
The water content of the body is maintained by

getting rid of excess water through excretory system. Marine animals need to conserve water that's why water is reabsorbed by excretory system in marine animals. 3

**Q.10.** The inner lining of the small intestine contains numerous villi. Are villi helpful in food absorption? Give the reason behind your answer. 5

**Ans.** The major part of the process of digestion of food takes place in the small intestine. The digested food is taken up by the walls of the intestine. The inner lining of the small intestine contains numerous finger like projections called villi. The villi increase the surface area for absorption. Each villus is covered by a single layer of epithelium and contains blood vessels and lymph vessel. The food diffuses through the epithelium into the blood vessels.

Glucose, amino acids, minerals and vitamins are absorbed in the blood vessels of the villi; the fatty acids and glycerol are absorbed by lacteals, which are carried to lymph vessels to the point where the lymph vessels empty into the blood stream. 5

## Value Based Questions

**Q.1.** A balanced diet should contain carbohydrates, fats, proteins, vitamins, minerals, water and roughage in adequate amounts. Junk food is an informal term applied to some foods which are perceived to have little or no nutritional value, or to products with nutritional value but which also have ingredients considered unhealthy when regularly eaten or those considered unhealthy to consume at all. It includes food that are high in salt, sugar, fat or calories and low in nutrient content.

(i) What is malnutrition?

(ii) Evaluate the relationship between 'Junk food and Health.' 3

**Ans.** (i) Malnutrition is a condition that results from eating a diet in which nutrients are either not enough or are too much, it may either be called undernutrition or overnutrition. 1

(ii) Relationship between Junk food and health is antagonistic.

(a) Junk food does not provide proper nutrition.

(b) Eating more junk food can lead to obesity.

(c) This may eventually lead to heart disease. 2

**Q.2.** Eating junk food results in several health problems including obesity and heart problems. Still lot of children prefer to eat junk food. What suggestions will you give to avoid eating junk food. 3

**Ans.** (i) Prefer and enjoy eating fruits and vegetables.

(ii) Choose a diet that provide enough calcium and iron and proteins to meet their growing body's requirements.

(iii) Add fresh vegetables to pizzas, burger, if you can't avoid eating them. 2

**Associated Value :** The children will prefer healthy food once they understand the ill effects of taking fast and junk food. 1

**Q.3.** Rahul wants to build up his body very quickly without following right exercise regime and balanced diet. Instead he started eating readymade food supplement.

(i) In your opinion was the step taken by Rahul right? Justify your answer.

(ii) What are the harmful effects of taking artificial health supplement without consulting a physician? 3

**Ans.** (i) No the step taken by Rahul was not right.

(ii) It can lead to addiction and can affect the health adversely. 2

**Associated Value :** The learners will be discouraged to get influenced from others taking any food supplements that harm their health. 1

**Q.4.** Om, Rohit and Kishore always remain in a hurry. One day, during lunch hour they all quickly gulped food and went out to play.

Om suddenly developed stomach ache while playing. What according to you might have gone wrong with him. 3

**Ans.** Om developed stomach ache as he had not chewed his food properly. Chewing food properly helps in proper breakdown of food and mixing it with saliva. Large food pieces if enter the stomach might cause damage. 2

**Associated Value :** The learners will start chewing their food properly for healthy digestion. 1

**Q.5.** Regular physical exercise for 45 minutes is advisable for normal functioning of human body. Comment upon the advantages of this statement/practice in daily life.

**Ans.** (i) A good, regular exercise keep diabetes under check.



- (ii) Exercise is also crucial to those who are obese or overweight.
- (iii) Weight training exercises increases uptake of calcium in the bones and help in preventing osteoporosis (Bone disease).
- (iv) Regular exercise also reduces bad cholesterol in our body and helps in improving the function of the heart. 2

**Associated Value :** The learners will be motivated to take up sports activities more regularly to keep them healthy. 1

**Q. 6.** Sohan went to his town Agra 200 Km away from Delhi with his father in a car. On the way, there was lot of traffic jam. Sohan while reaching his town felt nausea and headache. He had inhaled lots of toxic polluted gases.

- (i) Which system/part of his body gets affected?
- (ii) What steps could be taken to reduce the air pollution? 3

**Ans.** (i) Respiratory system/lungs will get affected.

- (ii) (a) Factories should treat harmful waste & filter it before releasing it in the environment.
- (b) Less polluting fuels like CNG should be used in vehicles.
- (c) Regular pollution check and proper service and maintenance should be done for private vehicles. 2

**Associated Value :** The learners will start taking up more eco-friendly transit system like metro to travel besides advocating car pool among others. 1

**Q. 7.** You are going through the Science notebook of your brother. You suddenly come across a question stating 'what is the reason behind regular formation of cramps in cricketers ? Your brother stated the answer as ' cramps are developed due to tear in ligament'. Is this answer correct ? State reasons for your answers. 3

**Ans.** No, the answer is not correct. Sometimes during rigorous physical work or exercise the amount of oxygen declines in our muscle cells. At this time when the oxygen is less in amount, pyruvate breaks down in insufficient oxygen and form lactic acid instead of carbon dioxide and water. 2

Cramps are formed in the body of cricketers due to the sudden formation of lactic acid. 1

**Q. 8.** Anil was walking in the park when he saw the man next to him collapse suddenly. He rushed him to the hospital where the doctor checked him and told him that he collapsed due to low blood pressure.

- (a) What is blood pressure and how is it measured?
- (b) What is normal systolic and diastolic pressure?
- (c) What values are shown by Anil?

**Ans.** (a) pressure exerted by blood on the arterial wall/ sphygmomanometer

(b) 120/80 mm of Hg

(c) Love, caring, presence of mind, prefer and enjoy eating fruits and vegetables.

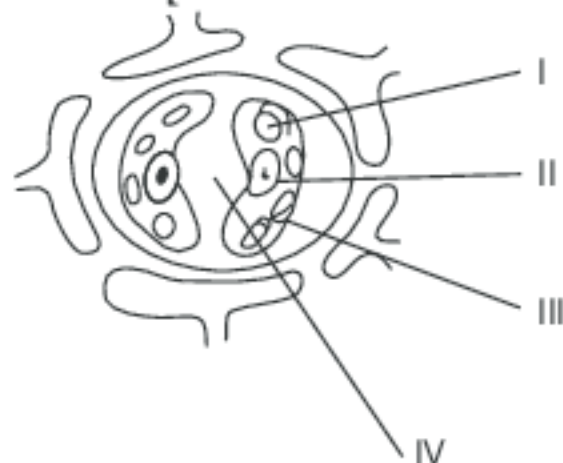
(ii) Ch

## Practical Based Questions

**Experiment 1 :** Preparing a temporary mount of a leaf peel to show stomata.

**Experiment 2 :** Experimentally show that carbon dioxide is given out during respiration.

**Q. 1.** In the diagram given below. Ankita labelled the diagram as— [Board Term I, Set-L7ZSVCH/2016]



- (i) Stomatal pore
- (ii) Guard cell
- (iii) Nucleus
- (iv) Chloroplast

Is she correct ? If not, then do the correct labelling ?

**Ans.** No, she was not correct.

Correct labelling should be :

- (i) Guard cell

- (ii) Nucleus
- (iii) Chloroplast
- (iv) Stomatal pore

$$\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2}$$

[CBSE Marking Scheme 2016]

**Q. 2.** Shyama and Rehana prepared temporary mounts of leaf peel separately. Shyama obtained a clear slide whereas Rehana observed irregular patches when observed under a microscope. What could be the possible anomaly in Rehana's slide preparation and how it can be eliminated ?

[Board Term I, Set-IZHNPNO, 2016]

**Ans.** The possible anomaly is the formation of air bubbles. Place the coverslip over the peel gently with the help of a needle.

[CBSE Marking Scheme 2016]

**Q. 3.** Johanson observed the temporary mount of a leaf peel under a compound microscope and found one pore as an elliptical pore and the other kidney shaped. Name the parts.

[Board Term I, Set-IZHNPNO, 2016]

**Ans.** Elliptical shape pore is stoma.  
Kidney shape is guard cells.

1 + 1

[CBSE Marking Scheme 2016]

**Q. 4.** State the importance of stomata for a plant.

[Board Term I, Set-IZHNPN0]

**Ans.** Importance of Stomata—

- (i) Helps in exchange of gases like  $O_2$  and  $CO_2$ .
- (ii) Removes extra water from leaves by transpiration.

[CBSE Marking Scheme 2016] 1 + 1

**Q. 5.** In an experiment to prepare the temporary mount of a leaf peel to show stomata why glycerine and safranin are used ?

[Board Term I, Set NS9SXID, 2016]

**Ans.** (i) Leaf peels are mounted in glycerine to prevent it from drying.

- (ii) Safranin is used to stain the leaf peels.

1 + 1

**Q. 6.** Mention any two functions of epidermis.

[Board Term I, Set- A8JV2IC, 2015]

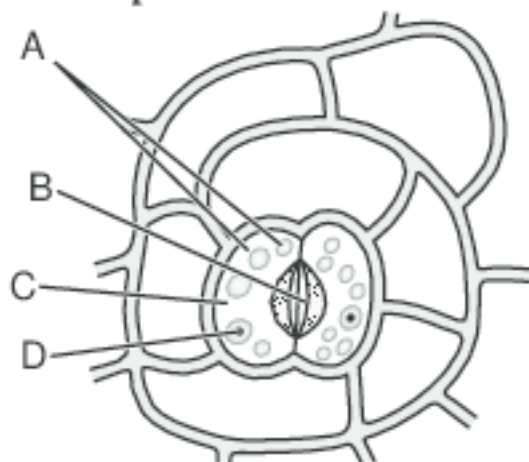
**Ans.** (i) Epidermis on the aerial parts of plants often secrete a waxy, water resistant layer on their outer surface.

- (ii) They prevent water loss, mechanical injury and invasion by parasitic bacteria or fungi.

1 + 1

[CBSE Marking Scheme 2015]

**Q. 7.** A student prepared the temporary mount of stained leaf peel. After observing the slide under microscope, he drew the following sketch. Identify and name the parts labelled as A, B, C and D.

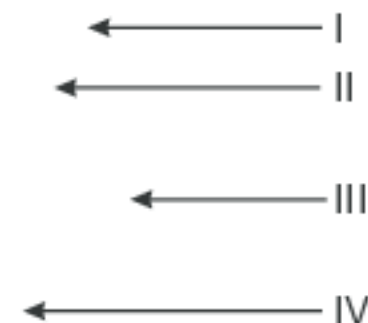


[Board Term I, Set-WH1SGOB, 2014]

**Ans.** (A) Chloroplast (B) Stomatal pore or stoma

(C) Guard cell (D) Nucleus  $\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2}$

**Q. 8.** In the given figure label the structures I, II, III, and IV marked in the diagram.



**Ans.** I – Epidermal cells

II – Chloroplast

III – Nucleus

IV – Stoma.

 $\frac{1}{2} \times 4$ 

**Q. 9.** Why upper surface of the leaf has fewer stomata ?

**Ans.** Fewer stomata on the upper surface prevent excessive loss of water due to transpiration as this surface is directly exposed to sunlight.

2

**Q. 10.** What precautions should be taken to study the liberation of carbon dioxide gas during aerobic respiration ?

**Ans.** Precautions are :

- (i) Ensure that the experimental set-up is air-tight.

- (ii) KOH is corrosive. Handle it carefully.

1 + 1

**Q. 11.** Why KOH solution is kept in the test-tube inside the air-tight conical flask while doing the experiment of respiration of seeds ?

**Ans.** KOH solution kept in the test-tube inside the air-tight conical flask absorbs the evolved carbon dioxide released by germinating seeds thereby creating a partial vacuum in the conical flask.

So an equal volume of water rises up in the tube. This indicates that the germinating seeds are actively respiring and evolving carbon dioxide gas during the process of respiration.

2

**Q. 12.** Why a leaf is boiled in alcohol before doing starch test ?

**Ans.** The leaf is boiled to remove its chlorophyll. Green colour of chlorophyll might hinder the reaction of starch with iodine.

1 + 1

## Know the Links

- [www.slideshare.net](http://www.slideshare.net)
- [dronstudy.com](http://dronstudy.com)

