INTERNATIONAL INDIAN SCHOOL BURAIDAH

CHAPTER 05 LIFE PROCESSES

(Solved)

SUBJECT: SCIENCE

CLASS : X

SECTION – A

Questions 1 to 10 carry 1 mark each

1. Which of the following equation is of photosynthesis?

(a) $6CO_2 + 12H_2O \rightarrow C_6H_{12}O_6 + 6O_2 + 6H_2O$

(b) $6CO_2 + H_2O + \text{Sunlight} \rightarrow C_6H_{12}O_6 + O_2 + 6H_2O$

(c) $6CO_2 + 12H_2O + \text{Chlorophyll} + \text{Sunlight} \rightarrow C_6H_{12}O_6 + 6O_2 + 6H_2O$

(d) $6CO_2 + 12H_2O + \text{Chlorophyll} + \text{Sunlight} \rightarrow C_6H_{12}O_6 + 6CO_2 + 6H_2O$

Ans: (c) $6CO_2 + 12H_2O + \text{Chlorophyll} + \text{Sunlight} \rightarrow C_6H_{12}O_6 + 6O_2 + 6H_2O$

2. Which of the following statement is true about respiration?

(i) During inhalation, ribs move inward and diaphragm is raised

(ii) In the alveoli, exchange of gases takes place i.e., oxygen from alveolar air diffuses into blood

and carbon dioxide from the blood into the alveolar air

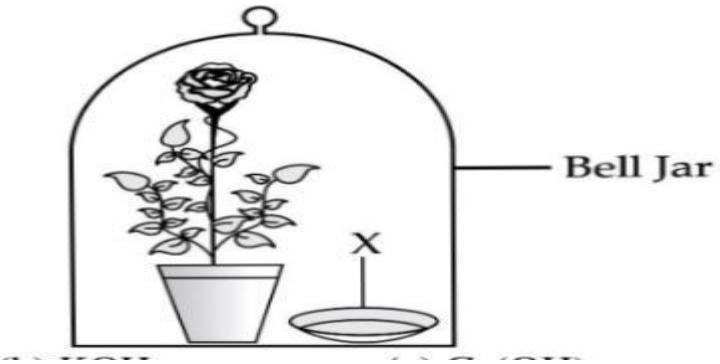
(iii) Haemoglobin has a greater affinity for carbon dioxide than oxygen

(iv) Alveoli increase surface area for exchange of gases

(a) (i) and (iv) (b) (ii) and (iii) (c) (i) and (iii) (d) (ii) and (iv)

Ans: (d) (ii) and (iv)

3. Observe the experimental setup shown below. Name the chemical indicated as ‘X’ that can absorb the gas which is evolved as a by-product of respiration.



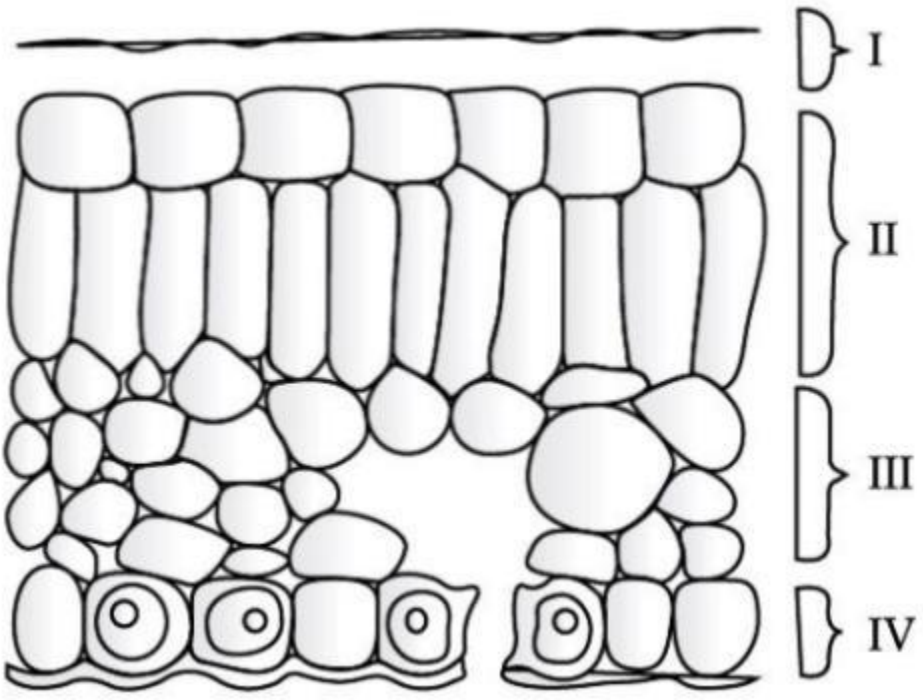
(a) NaOH (b) KOH (c) Ca(OH)2 (d) K2CO3

Ans: (b) KOH

Potassium hydroxide (KOH) absorbs all the available carbon dioxide in the bell jar.

4. In the given transverse section of the leaf identify the layer of cells where maximum photosynthesis occurs.

rs.



(a) I, II (b) II, III (c) III, IV (d) I, IV

Ans: (b) II, III

The palisade mesophyll and spongy mesophyll layer is made up of closely-packed, elongated cells located just below the upper epidermis. They contain chloroplasts and carry out most of the photosynthesis.

5. A sportsman, after a long break of his routine exercise, suffered muscular cramps during a heavy

exercise session. This happened due to:

(a) lack of carbon dioxide and formation of pyruvate.

(b) presence of oxygen and formation of ethanol.

(c) lack of oxygen and formation of lactic acid.

(d) lack of oxygen and formation of carbon dioxide

Ans: (c) lack of oxygen and formation of lactic acid.

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 cause cramps or fatigue.

6. Which of the following statement is true about the heart?

(i) The left atrium receives oxygenated blood from different parts of the body while the right

atrium receives deoxygenated blood from lungs

(ii) Left ventricle pumps oxygenated blood to different body parts while right ventricle pumps

deoxygenated blood to lungs

(iii) Left atrium transfers oxygenated blood to the right ventricle which sends it to different body

parts

(iv) The right atrium receives deoxygenated blood from different parts of the body while the left

ventricle pumps oxygenated blood to different parts of the body

(a) (i) (b) (ii) (c) (ii) and (iv) (d) (i) and (iii)

Ans: (c) (ii) and (iv)

Oxygenated blood circulates through the left part of the heart whereas deoxygenated blood

circulates through the right part of the heart. Atrium receives blood and ventricle pumps the blood out of the heart.

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

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

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

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

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

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

8. 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

Ans: (b) Starch breaking down into sugars

The Salivary Amylase enzyme present in the saliva breaks down Starch into simpler sugar and

helps in digesting them. Hence the breakdown of starch will be affected if salivary amylase is

lacking in the saliva.

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of reason

(R). Mark the correct choice as:

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

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

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

9. Assertion (A): Hydrochloric acid helps in the digestion of food in the stomach.

Reason (R): Hydrochloric acid creates an acidic medium to activate protein digesting enzymes.

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

assertion (A).

The gastric glands present in the wall of the stomach release hydrochloric acid, pepsinogen and

mucus. Hydrochloric acid provides the acidic medium for the activation of pepsinogen into

pepsin.

10. Assertion (A): Amphibians can tolerate mixing of oxygenated and deoxygenated blood.

Reason (R): Amphibians are animals with two chambered heart.

Ans. (c) Assertion (A) is true but reason (R) is false.

The heart of an amphibian, such as a frog, has three chambers, one ventricle and two atria.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. What is translocation? Why is it essential for plants?

Ans: The transport of food from the leaves to other parts of the plant is called translocation.

Leaves of the plants perform photosynthesis and produce carbohydrates (sugar) in the form of

food which are translocated to the other parts of the plant through phloem. This allow plants to

have access to raw materials needed during photosynthesis by leaves.

12. How does gaseous exchange take place in fish?

Ans: Aquatic animals like fish use gills as their respiratory organ. Respiration through gills is

known as branchial respiration. The blood flowing in the capillaries of gills absorb oxygen and

gives carbon dioxide to the water passing over them by diffusion through thin epithelium.

13. Why do arteries have thick and elastic walls whereas veins have valves?

Ans. Arteries are the vessels which carry blood away from the heart to various organs of the

body. Since the blood emerges from the heart under high pressure, the arteries have thick, elastic

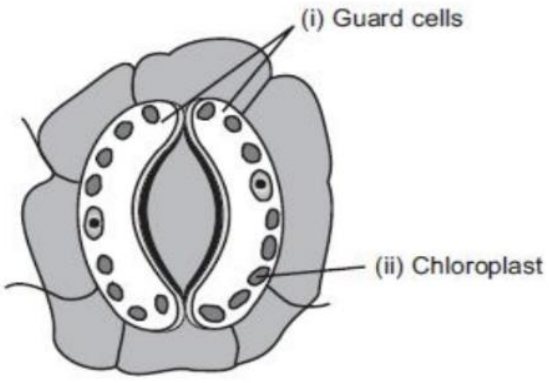
walls whereas veins collect the blood different organs of the body and carry it back to the heart

so, they do not have thick walls as the blood they carry is no longer under pressure instead they

have valves that ensure that the blood flows only in one direction

14. Draw a diagram to show open stomatal pore and label on it: (i) guard cells (ii) chloroplast

Ans:



SECTION – C

Questions 15 to 17 carry 3 marks each.

15. (a) What is the role of HCl in our stomach?

(b) What is emulsification of fats?

(c) Which protein digesting enzyme is present in pancreatic juice?

Ans: (a) (i) It sterilises food by killing pathogens and other microbes.

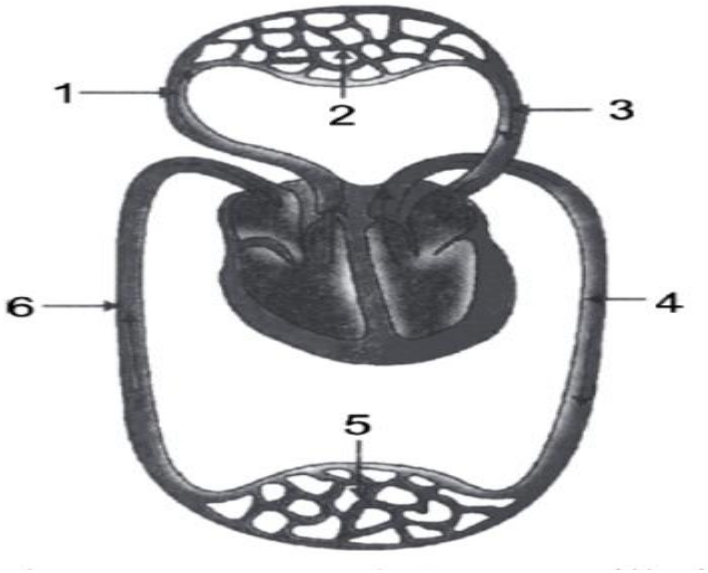
(ii) It has a pH of 2, which is perfect for entyaus such as pepsin to break down proteins as effectively as possible.

(iii) Helps emulsify food (digestion of protein and stimulates the pancreas to produce digestive enzymes and bile) and protects against harmful bacteria

(b) Breakdown of large gloubule fats into smaller fats droplets is known as emulsification.

(c) Trypsin is the enzyme secreted by the pancreas which aids in digestion of proteins.

16. (a) Label any 4 parts in the given diagram.



(b) What are the two functions represented in this diagram?

Ans: (a) 1. Pulmonary artery to lungs 2. Lung capillaries

3. Pulmonary vein from lungs 4. Aorta to body

5. Capillaries in body organs 6. Vena cava from body. (any four)

(b) The two functions represented are :

(i) Transport of oxygen and carbon dioxide

(ii) Exchange of oxygen and carbon dioxide

17. (a) What is double circulation?

(b) Why is the separation of the right side and the left side of the heart useful? How does it help birds and mammals?

Ans. (a) The circulatory system of man is called double circulation as the blood passes through the heart twice in one complete cycle of the body.

(b) The right side and the left side of the human heart are useful to prevent deoxygenated and oxygenated blood from mixing. This type of separation of oxygenated and deoxygenated blood

ensures a highly efficient supply of oxygen to the body. This is useful in case of birds and

mammals because it constantly gives energy to maintain their body temperature.

SECTION – D

Questions 18 carry 5 marks.

18. (a) Draw a labelled diagram of the respiratory system of human beings with diaphragm at the end of expiration.

(b) List four conditions required for efficient gas exchange in an organism.

Ans: (a)

(b) The conditions required for efficient gas exchange in an organism are that the membrane

should be extensive, thin, highly vascularised and easily permeable to oxygen and carbon

dioxide.

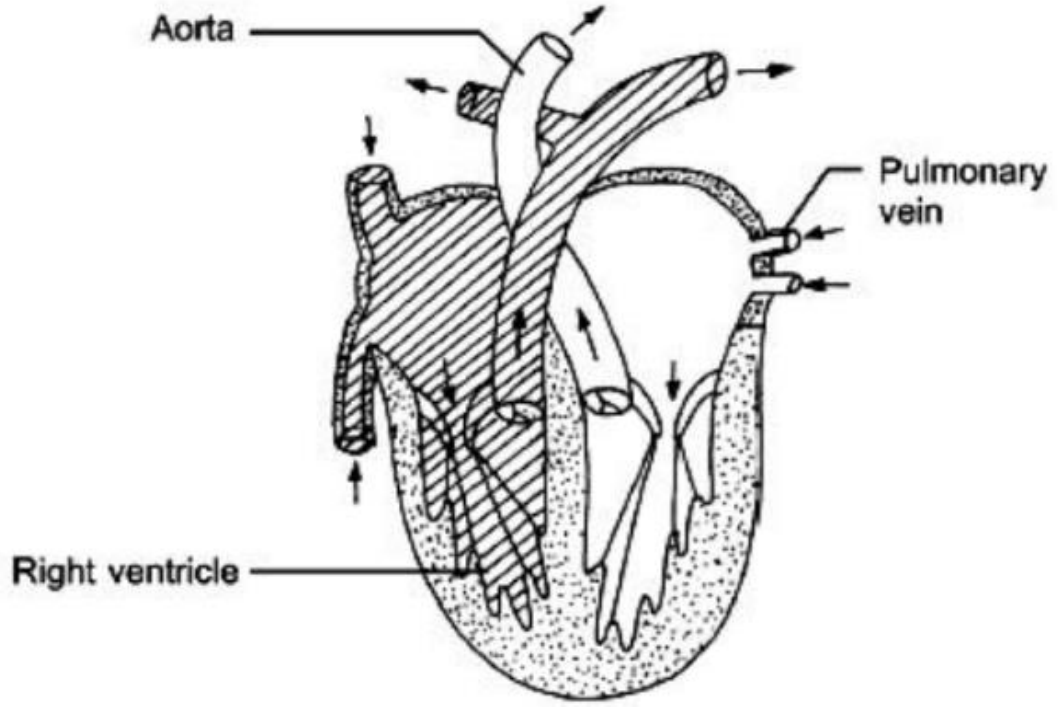
OR

(a) Draw a sectional view of the human heart and label on it – Aorta, Right ventricle and

Pulmonary veins.

(b) State the functions of the following components of transport system: (i) Blood (ii) Lymph

Ans: (a)



(b) The functions of the following components of the transport system are :

(i) Blood:

• Oxygen is transported to the tissues of the body for the purpose of respiration.

• Carbon dioxide is transported to the lungs by the blood plasma.

• The digested and absorbed nutrients are transported to the tissues.

• Nitrogenous wastes are transported to the kidneys.

• The blood regulates the body temperature.

• It maintains the pH of the body tissues.

• It transports various hormones from one region to another and bring about the coordination.

• It maintains water balance to constant level.

• The lymphocytes produce antibodies against the invading antigens and protects from diseases.

• Blood helps in rapid healing of wounds by forming a clot at the site of injury.

(ii) Lymph:

• It carries digested and absorbed fat from intestine and drains excess fluid from extracellular

space back into the blood.

• It protects the body by killing the germs drained out of the body tissues with the help of

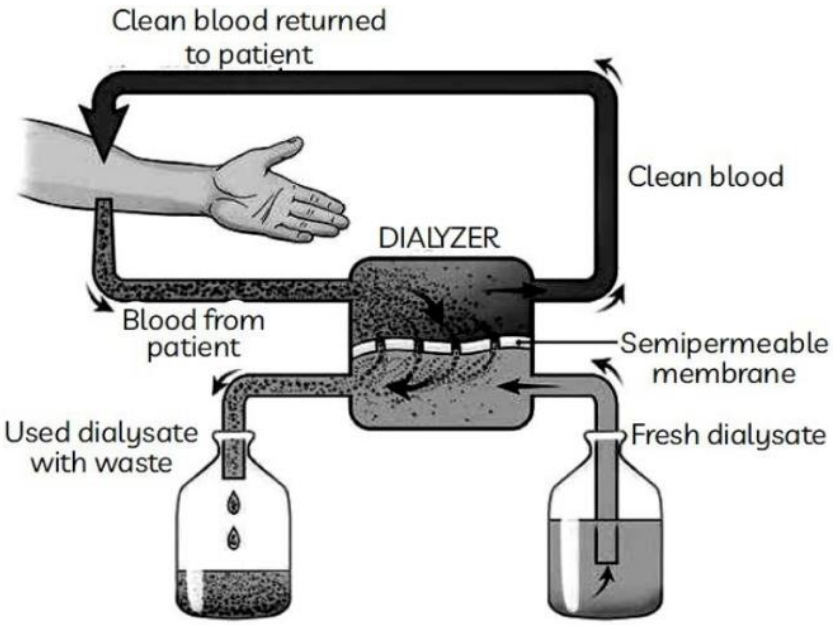
lymphocytes contained in the lymph nodes.

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Read the given passage and answer the questions based on passage and related studied concepts.

The figure shown below represents a common type of dialysis called Haemodialysis. It removes waste products from the blood. Such as excess salts, and urea which are insufficiently removed by the kidney in patients with kidney failure. During the procedure, the patient's blood is cleaned by filtration through a series of semipermeable membranes before being returned to the blood of the patient. On the basis of this, answer the following questions:



(a) (i) Name the filtering units present in the human kidneys.

(ii) Name the main excreting waste removed by kidneys from blood?

(b) What are the two main functions of kidneys?

(d) What are the major factors on which the amount of water reabsorbed in the part of nephron

depends?

Ans: Ans. (a) (i) The filtering units present in the human kidneys are nephrons.

(ii) The main excreting waste removed by kidneys from blood is urea.

(b) The functions of kidneys are: excretion and osmoregulation. Kidneys remove nitrogenous

waste from the blood and maintains salt and water concentration in the body.

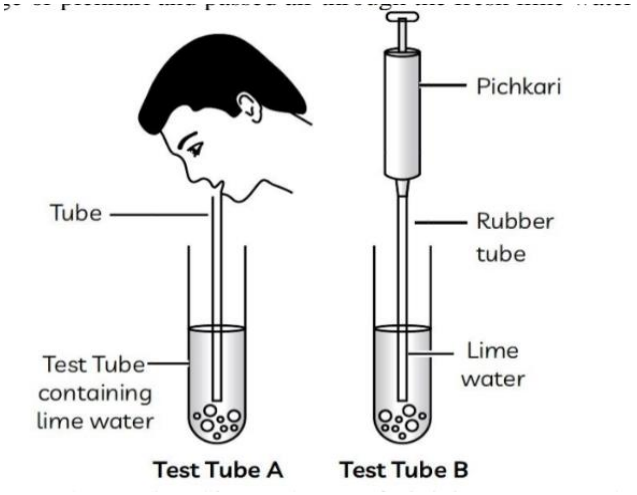
(c) The factors on which the amount of water reabsorbed depends on

(i) the amount of excess water present in the body.

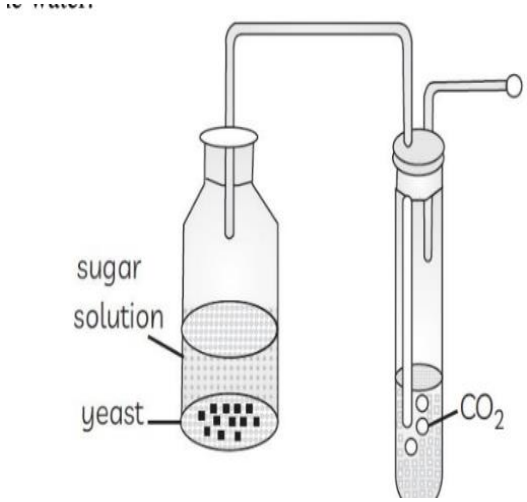
(ii) the amount of dissolved waste to be excreted.

20. In the first activity, a student Rudra took some freshly prepared lime water in two test tubes marked A and B. He blew air through the lime water in test tube A.

He then used a syringe or pichkari and passed air through the fresh lime water in test tube B.In the second activity, another student Siya took some fruit juice or sugar solution and



added some yeast to this. She took this mixture in a test tube fitted with a one-holed cork and fitted the cork with a bent glass tube. She dipped the free end of the glass tube into a test tube containing freshly prepared lime water.



(a) In the first activity, what were the observations made by Rudra? What can be interpreted from his observations?

(b) Siya performed the second activity by taking yeast powder and fruit juice, she observed that lime water turned milky after few hours.

(i) What does this activity suggest to you?

(ii) What are the products formed during this acitivity?

(c) Name the energy currency in living organisms. When is it produced? One application of energy currency produced in the cell.

Ans: (a) In test tube A, Lime water turned milky immediately and in test tube B: Lime water turned milky after a long time. Lime water turns milky when carbon dioxide gas is passed through it as a white precipitate of calcium carbonate is formed when lime water (calcium hydroxide) reacts with carbon dioxide gas.

Lime water turns milky in test tube A as the exhaled air is rich in carbon dioxide. Whereas, lime water takes a lot of time to turn milky in test tube B as the amount of carbon dioxide present in atmospheric air is very less as compared to exhaled air and hence, carbon

dioxide is produced after a long time So, we can say that the amount of carbon dioxide is more in exhaled air and very less in the

atmosphere.

(b) (i) This activity demonstrates the process of fermentation.

(ii) The products formed during fermentation are ethyl alcohol (ethanol), carbon dioxide and energy.

(c) ATP (Adenosine triphosphate) is the energy currency in the living organisms. It is produced during cellular respiration. ATP is used to fuel all the activities in the cell. In these processes,ATP is broken down giving rise to a fixed amount of energy which can drive the endothermic reactions taking place in the cell