

## Long Question Answer

Q1.(a) Draw a diagram to show open stomatal pore and label on it:

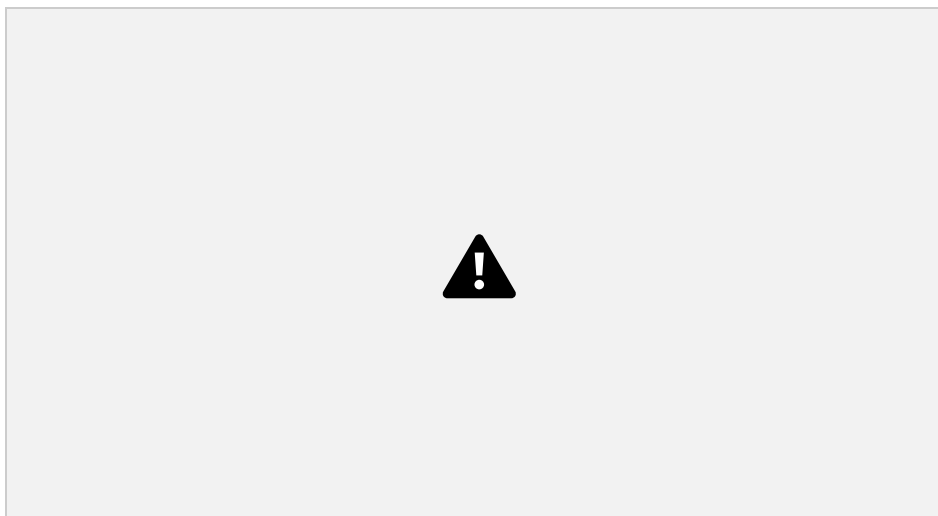
(i) guard cells

(ii) chloroplast

(b) State two functions of stomata.

(c) How do guard cells regulate the opening and closing of stomatal pore?

Answer.(a)



(b) Two functions of stomata are:

(i) Exchange of gases between the plant and the atmosphere takes place through stomata.

(ii) Transpiration in plants takes place through stomata.

(c) Opening and Closing of Stomatal Pore: The opening and closing of the pore is a function of the guard cells. The guard cells swell when water flows into them causing the stomatal pore to open. Similarly, the pore closes if the guard cells shrink. As large amount of water is lost through these stomata, the plant closes these pores when it does not require carbon

dioxide for photosynthesis.

Q2.(a) 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.

(b) Why is the rate of breathing in aquatic organisms much faster than in terrestrial organisms?

Answer.(a)



(b) Quantity of dissolved oxygen is fairly low in water as compared to the amount of oxygen in air. Aquatic organisms therefore have to breathe faster than terrestrial organisms to absorb the required amount of oxygen from the water.

Q3. Draw a neat diagram of excretory system of

human beings and label the following:

(i) Kidney

(ii) Ureter

(iii) Urinary Bladder

(iv) Urethra

Answer.

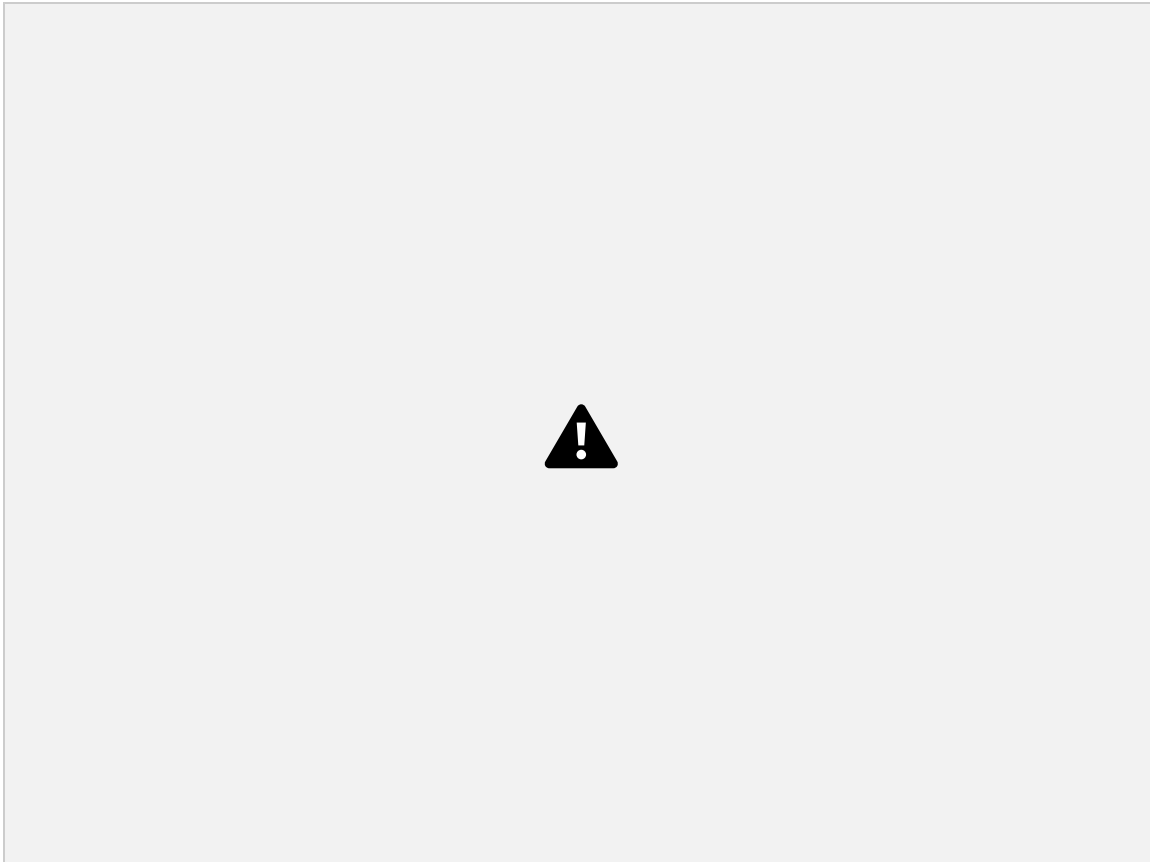


Q4.(a) Draw a sectional view of the human heart and label on it – Aorta, Right ventricle and Pulmonary veins.

(b) State the functions of the following components of transport system:

(i) Blood (ii) Lymph

Answer.(a)



(b) The functions of blood and lymph are as follows:

(i) Blood

Oxygen is transported by the blood to the tissues of the body for the breakdown of digested food.

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

The digested and absorbed nutrients are transported by blood to the tissues.

Nitrogenous wastes are transported to the kidneys.

It regulates the body temperature and 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 protect from diseases.

It helps in rapid healing of wounds by forming a



clot at the site of injury.

(ii) Lymph

It cleans the cellular environment.

It returns proteins and tissue fluids to the blood (drainage)

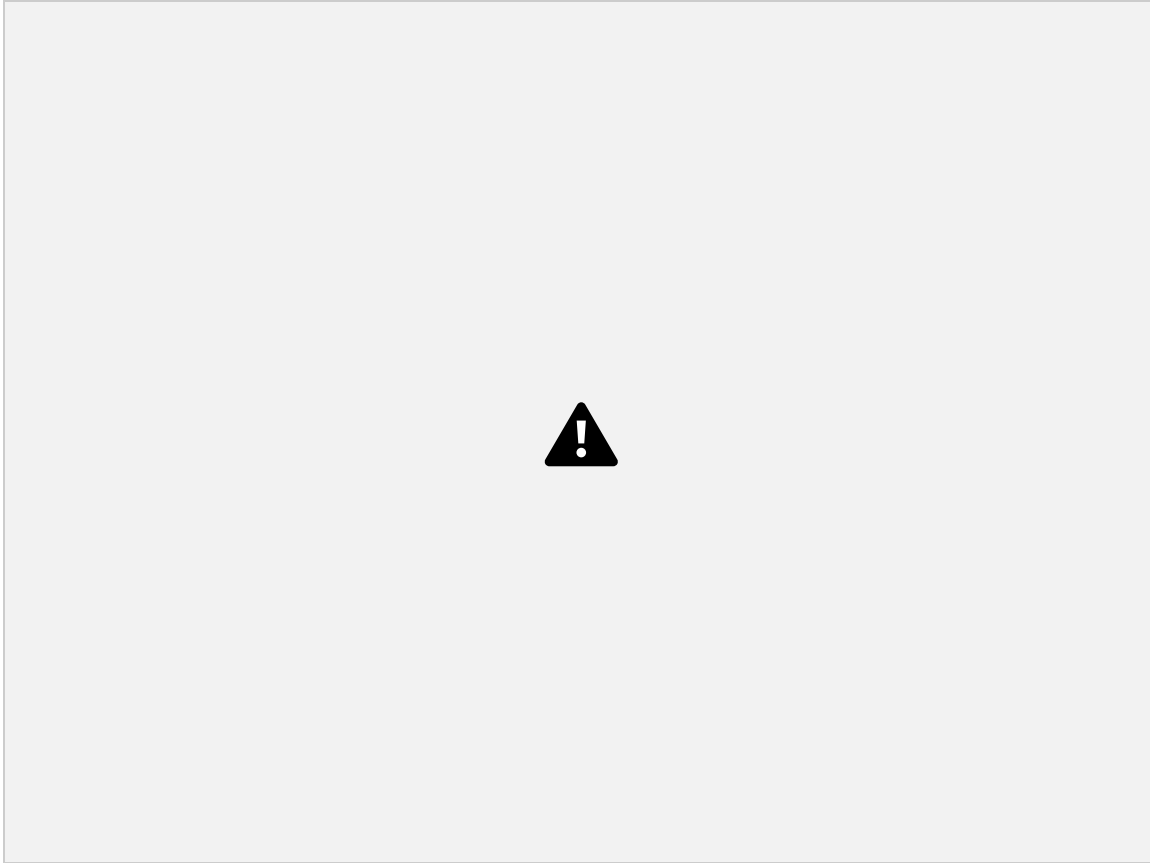
It provides a pathway for the absorption of fats and fat-soluble vitamins into the bloodstream.

It defends the body against disease.

Q5.(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.

Answer.(a)



(b) (i) A large surface area over which exchange can take place.

(ii) A concentration gradient without which nothing will diffuse.

(iii) A thin surface across which gases diffuse.

(iv) Warm conditions.

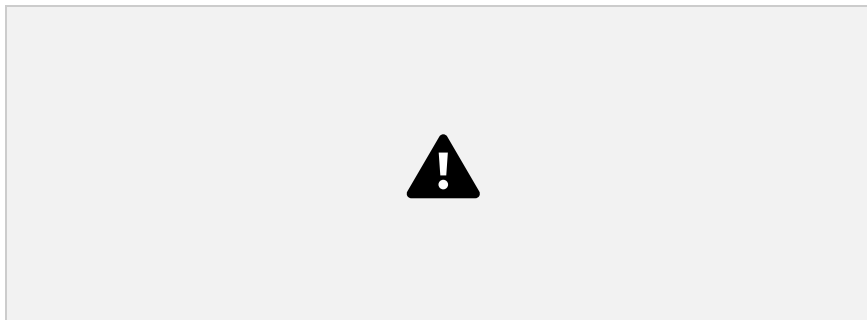
Q6.(a) Draw a diagram to show the nutrition in

Amoeba and label the parts used for this purpose. Mention any other purpose served by this part other than nutrition.

(b) Name the glands associated with digestion of starch in human digestive tract and mention their role.

(c) How is required pH maintained in the stomach and small intestine?

Answer.(a)



Pseudopodia serves the purpose of locomotion apart from nutrition.

(b) The salivary gland is associated with digestion of starch in human digestive tract.

It secretes saliva which contains enzyme

salivary amylase. This enzyme converts starch into maltose (sugar).

(c) Gastric glands present on the walls of the stomach release HCl. HCl creates an acidic medium, which facilitates the action of enzyme pepsin. Bile juice from liver makes the food alkaline in small intestine for the pancreatic enzymes to act.

Q7.(a) List the three events that occur during the process of photosynthesis.

Explain the role of stomata in this process.

(b) Describe an experiment to show that “sunlight is essential for photosynthesis.”

Answer.

(a) The three events that occur during the process of photosynthesis are:

(i) Absorption of light energy by the green pigment chlorophyll.

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

(iii) Reduction of carbon dioxide into carbohydrate.

### Role of Stomata

Stomata are tiny pores present on the surface of leaves. They are also present on the surface of young stems. Stomata are mainly engaged in the exchange of gases (entry of CO<sub>2</sub> and release of O<sub>2</sub> ) associated with photosynthesis. Plant closes the stomata when it does not need CO<sub>2</sub> for photosynthesis.

(b) Sunlight is essential for photosynthesis



### Procedure:

(i) Place a healthy green potted plant in a dark room for 1-2 days. This is done to ensure that the plant consumes all its reserve food and the leaves do not contain any starch.

(ii) Then, cover a portion of a leaf of this plant on both sides with two uniform pieces of black paper, fixed in position with two paper clips.

(iii) Now, expose this plant to bright light. After a few hours, remove the leaf and decolorize it with alcohol and test the presence of food (starch) with iodine solution.

Observation: It can be observed that the portion of the leaf covered with black paper does not (food),

Conclusion: This is because the food prepared

by plants through the process of photosynthesis is stored as starch. Starch reacts with the iodine solution to give blue-black colour. Only those portions of the leaf that were exposed to sunlight could photosynthesise. Hence, gives blue- black colour when tested with iodine. The portion of the leaf covered with black paper did not receive sunlight. Hence, starch was not produced. Thus, it can be

concluded that the sunlight is essential for photosynthesis.

Q8.(a) What is meant by breathing? What happens to the rate of breathing during vigorous exercise and why?

(b) Define translocation with respect to transport in plants. Why is it essential for plants? Where in plants are the following synthesised?

(i) Sugar (iii) Hormone

Answer.

(a) The process of taking in of oxygen from air in to the lungs and expulsion of carbon dioxide out of the lungs is called breathing. The rate of breathing during vigorous exercise increases by about 20 to 25 times per minute. It is because, during vigorous exercise the demand for oxygen increases. Breathing occurs involuntarily but its rate is controlled by the respiratory center of the brain.

(b) Translocation is the transport of food from the leaves to other parts of the plant and occurs in the part of the vascular tissue known as phloem.

It is essential for plants because every part of the plant needs food for obtaining energy for building its parts and maintaining its life.



(i) Sugar is synthesised in the leaves of the plant.

(ii) Hormones are synthesised at the tips of roots and stems of a plant.

Q9.(a) Draw the structure of a nephron and label the following on it:

Glomerulus, Bowman's capsule, Renal artery, Collecting duct.

(b) What happens to glucose that enters the nephron along with filtrate?

Answer.(a)



(b) During excretion in human beings, glucose which enters the nephron along with filtrate gets reabsorbed by blood capillaries surrounding the nephron.



