

Q. (a) State the role played by the following in the process of digestion

- (i) Enzyme trypsin
- (ii) Enzyme lipase

[CBSE 2020]

(b) List two functions of finger-like projections present in the small intestine.

Ans. (a)(i) Enzyme trypsin : This enzyme is produced by the pancreas in an inactive form called trypsinogen. Trypsin converts remaining proteins into peptones and the peptones into peptides and amino acids.

(ii) Enzyme lipase: It is secreted by pancreas and small intestine. Lipase converts fats into fatty acids and glycerol.

(b) Internally, the wall of the small intestine is provided with long finger-like projections called villi.

Two functions of villi are:

(i) The villi greatly increase the absorptive surface area of the inner lining of small intestine.

(ii) The large surface area of small intestine helps in rapid absorption of digested food.

Q. Describe double circulation in human beings. Why is it necessary?

[NCERT, CBSE 2011, 12, 13]

Ans. The heart of human beings consist of two sides right and left. The right side of the heart receives deoxygenated blood from the cells and tissues and sends it further for purification to lungs. The left side of the heart receives oxygenated blood from lungs which is pumped further and sent to all the parts of the body through blood vessels. This is called double circulation. The energy demand of human beings is too large and hence it is necessary for the separation of oxygenated and deoxygenated blood to meet this energy demand.

Q. Define the term transpiration. Design an experiment to demonstrate this process.

[CBSE 2019]

Ans. Loss of water vapour through the stomatal openings of the leaves of a plant is termed as transpiration. Following experiment can be performed to demonstrate transpiration in a plant.

(i) Place a healthy growing plant on a horizontal and plane slab in the sunlight.

(ii) Place a glass bell jar over the potted plant and seal its end to the slab by applying vaseline at its edges.

(iii) Allow the set-up to remain in the sunlight for some time.

(iv) Observe the presence of water droplets on the inner surface of the glass jar.

(v) This collection of water droplets is indicative of transpiration.

Q. Differentiate between fermentation in yeast and aerobic respiration on the basis of end products formed. [CBSE 2019]

Ans. During fermentation in yeast, ethanol is formed while in aerobic respiration, carbon dioxide and water are formed. The energy (ATP) released in the process of fermentation is also very less as compared to the aerobic respiration.

Q. State the location and the function of gastric glands? [CBSE 2019]

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

Q. List the steps of preparation of temporary mount of a leaf peel to observe stomata. [CBSE 2018]

Ans. The following are the steps of preparation of temporary mount of a leaf peel to observe stomata:

- (i) Remove a healthy leaf from the potted plant.
- (ii) Remove a part of the peel from the lower surface of the leaf by folding the leaf over and gently pulling the peel using forceps. Place the peel in a clean watch glass.
- (iii) Put a few drops of saffranin stain in a watch glass.
- (iv) After 2-3 minutes take out the peel and place it on a clean glass slide.
- (v) Put a drop of glycerin over the peel and place a clean coverslip gently over it.
- (vi) Remove the excess stain and glycerin with the help of blotting paper.
- (vii) Observe the slide under the low-power and high-power magnifications of the compound microscope.

Q. In the experimental set up to show that "CO₂ is given out during respiration", name the substance taken in the small test tube kept in the conical flask. State its function and the consequence of its use. [CBSE 2015]

Ans. The substance taken in the small test tube, kept in the conical flask is KOH (potassium hydroxide) solution. The CO produced by germinating seeds is absorbed by KOH solution due to which the air from the bent tube moves into the conical flask, which eventually pulls the water up in the bent glass tube.

Q. A student has set up "CO₂ is released during respiration". After about 1 hour he observes no change in the water level in the delivery tube. Write two possible reasons for the failure of the experiment. [CBSE 2015]

- (i) The setup was not air tight
- (ii) Geminating seeds were not moist
- (iii) One end of U-shaped delivery tube is placed in conical flask and the other end was not immersed in the water of the beaker.

Q. How is the small intestine designed to absorb the digested food?

[NCERT, CBSE 2013]

Ans. Small intestine has finger like projection in the inner lining which increases the surface area for absorption of food. These finger like projections are called villi. The villi are richly supplied with blood vessels which take the absorbed food to each and every cell of the body.

Q. Name the two glands associated with the digestive system in humans. Name their secretion also.

[CBSE 2013]

Ans. (i) Gastric glands These are present in the walls of stomach. These release HCl, a protein digesting enzyme called pepsin and mucus.

(ii) Pancreatic enzymes The pancreas secretes pancreatic juice which contains enzymes like trypsin digesting proteins and lipase for breaking down emulsified fats.

Q. What advantages over an aquatic

[NCERT,CBSE 2013]

(a) 1-chambered heart organism does a terrestrial organism have with

(b) 2-chambered heart regard to obtaining oxygen for respiration?

Ans. Aquatic organism takes in the oxygen dissolved in water which is in less percentage than the oxygen present in air. Terrestrial organism can take in more amount of oxygen at a time than aquatic organisms.

Q. Why rate of breathing in aquatic organisms is much faster than that seen in terrestrial organisms?

[CBSE 2013, 14]

Ans. Because the amount of dissolved oxygen is in the air.

Q. (a) Discuss the role of HCl, pepsin, bile and trypsin in the digestion of food in human body.

[CBSE 2014]

(b) Where are gastric glands located in alimentary canal of human?

Ans. (a) HCl It creates an acidic medium which facilitates the action of pepsin.

Pepsin->It digests proteins into peptones.

Bile->Bile breaks down fats into fat globules.

Trypsin->Trypsin digests protein.

(b) Gastric glands are present in the wall of the stomach.

Q. How do autotrophs obtain CO₂ and N, to make their food?

(CBSE 2014)

Ans. (i) CO₂ from atmosphere through diffusion of stomata.

(ii) N₂ is absorbed from soil in the form nitrates and nitrite

Q. Explain how the human body responds when adrenaline is secreted into the blood.

[CBSE 2013,14]

Ans. The heart beats faster, resulting in supply of more oxygen to our muscles. The blood to the digestive system and skin is reduced due to contraction of muscles around small arteries in these organs. This diverts the blood to our skeletal muscles. The breathing rate also increases because of the contractions of the diaphragm and the rib muscles.

Q.What is the role of saliva in the digestion of food? [CBSE 2012]

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 ptyaline.

Q. What is the role of acid in our stomach? [CBSE 2012]

Ans. Acid (HCl) present in our stomach makes the medium acidic so as to facilitate the action of the enzyme pepsin and it kills the bacteria ingested with food.

Q. Name any two digestive enzymes secreted in the human digestive system and write their functions. [CBSE 2011]

Ans. Salivary amylase->starch into sugar (maltose).

Pepsin->digest proteins into amino acids.

Trypsin->digest proteins into amino acids.

Lipase->digest fats into fatty acids and glycerol.

Q. Which is the internal energy reserve in plants? Do the animals have the same energy reserve? [CBSE 2011]

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

No, the animals have glycogen as internal energy reserve.

Q. In human alimentary canal, name the site of complete digestion of various components of food. Explain the process of digestion. [CBSE 2012]

Ans. Small Intestine 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 fats into fatty acids and glycerol.

Q. Assume that you are a veterinary you surgeon and you had removed a good length of the small intestine of a bear that was forward, into the stomach.suffering from a intestinal tumour. Now, would you suggest a plant based or an meat based diet for the bear after its recovery? Give reason for your answer. [CBSE 2011]

Ans. I would suggest meat based diet. Because to digest plant based diet, bear will need a longer small intestine. Since the cellulose present in plant diet requires longer time for digestion.

Q. Why do the walls of the trachea not collapse when there is less air in it?

[NCERT, CBSE 2012]

Ans. Presence of rings of cartilage in the throat ensure that the air passage does not collapse.

Q. Why is there a difference in the rate of breathing between aquatic organisms and terrestrial organisms? Explain [CBSE 2020]

Ans. Terrestrial organisms inspire atmospheric oxygen, while aquatic organisms thrive on the dissolved oxygen present in water. Air contains about 21% of oxygen while water has less than 1% oxygen in dissolved state. Oxygen diffuses through water at a much slower rate as compared to air. A terrestrial organism has the advantage of utilising greater amount of oxygen at a faster rate with lesser effort whereas, aquatic organisms have to put more effort to obtain the same amount of oxygen, therefore breathing in aquatic organisms is much faster than the terrestrial organisms.

Q. (a) Why is nutrition necessary for the human body? [CBSE 2020]

(b) What causes movement of food inside the alimentary canal?

Ans. (a) Human body continuously require energy for their life activities like respiration, circulation, excretion, etc. Energy is required even we are sleeping because a number of biological processes keep on occurring. All these processes require energy and this energy is obtained from nutrition. Nutrition is also needed for growth and repair of human body.

(b) The wall of alimentary tract contains muscles which can contract and expand alternately. The contraction and expansion movement of the walls of foodpipe is called peristaltic movement. The peristaltic movement moves the partially digested food in all the digestive organs throughout the alimentary canal.

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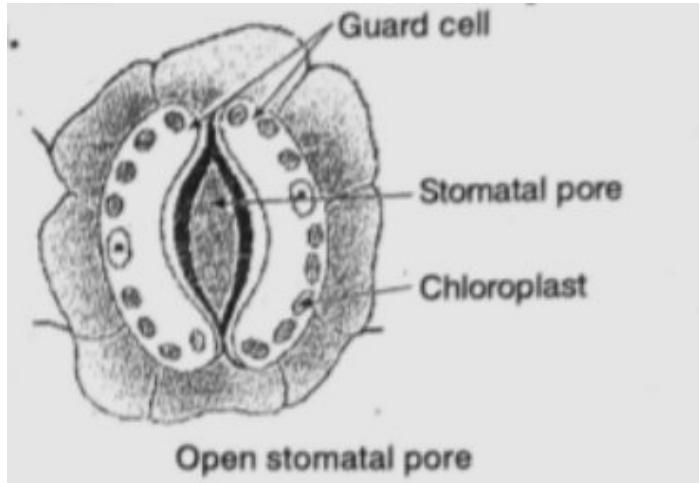


NO BAKWAS

Q. Draw the diagram of an open stomatal pore of a leaf and label on it chloroplast and guard cells.

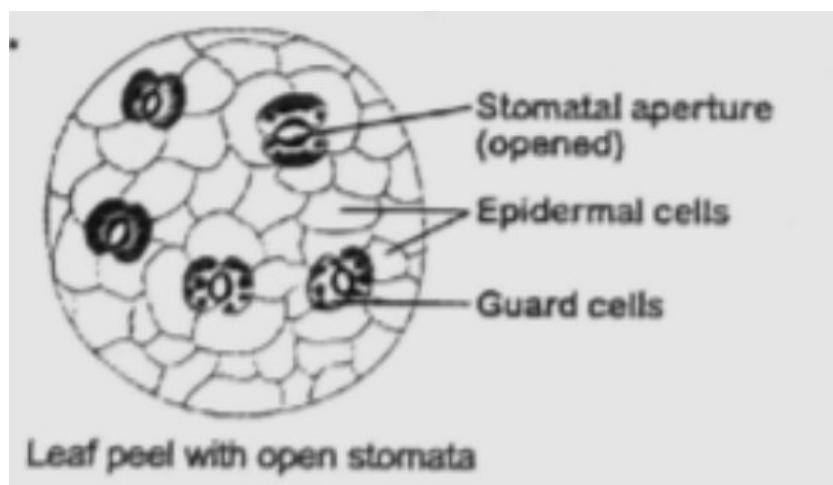
[CBSE 2014]

Ans.



Q. A student is observing the temporary mount of a leaf peel under a microscope. Draw labelled diagram of the structure of stomata as seen under the microscope.

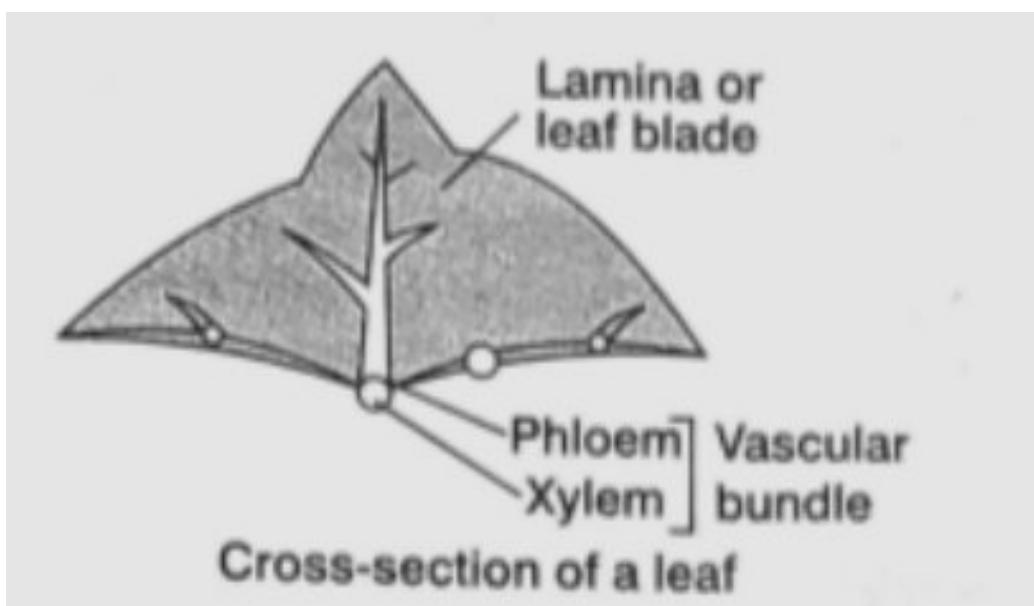
Ans.



Q. Draw a diagram showing cross-section of a leaf and label on it Phloem, Xylem, Vascular bundle, Lamina.

[CBSE 2012]

Ans.



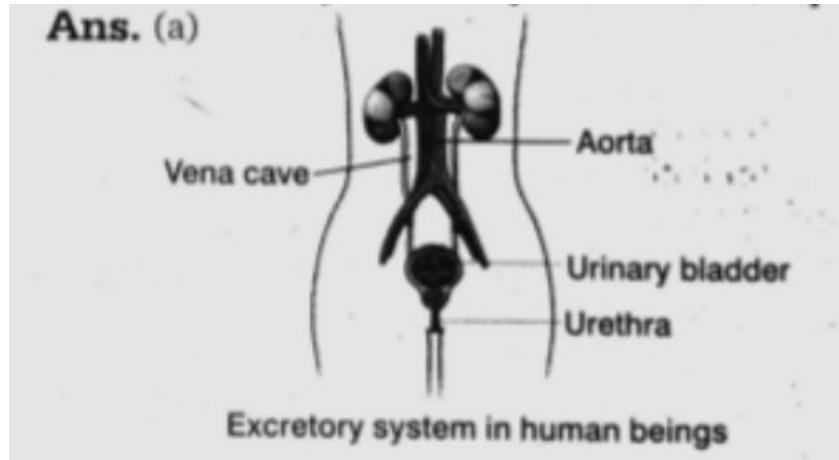
Q. (a) Draw a diagram of excretory system in human beings and label on it

Aorta, Vena cava, Urinary bladder,kidney.

[CBSE 2011, 12, 13]

(b) List two vital functions of the Urethra.

Ans.



(b) Two vital functions of kidneys are

- (i) They maintain the pH and salt concentration of body constant and also the water balance.**
- (ii) They help in removal of waste products that are harmful for human body.**

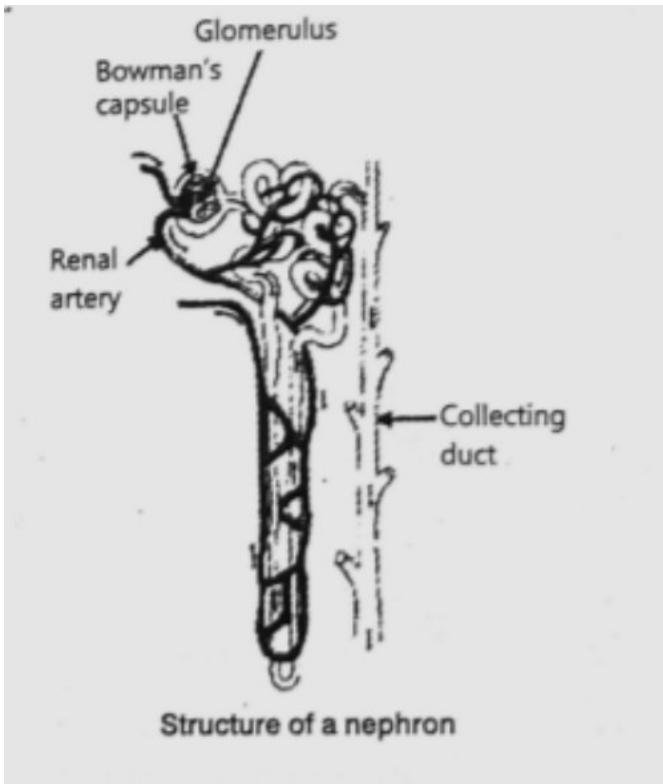
Q. Describe the structure and functioning of nephrons.

[NCERT, CBSE 2013]

Ans. Structure of nephrons It consists of a Bowman's capsule in which glomerulus is present (cluster of capillaries). The afferent artery brings the impure blood to nephron. The cup shaped structure (Bowman's capsule) form a tubular part of nephron which leads to collecting duct.

Working of Nephron

- (i) Filtration:-** The renal artery or afferent artery is wider and slowly it becomes a narrow tube in the glomerulus. Due to difference in the width, pressure difference is caused and water with dissolved impurities are squeezed out from the tube. It is collected in the Bowman's capsule which is cup like structure and passes into the tube.
- (ii) Reabsorption:-** The above filtrate passes through the tubule where the major amount of water, glucose, amino acids are selectively reabsorbed by the capillaries which are surrounding the tubule.
- (iii) Urine formation:-** The water and impurities which is not reabsorbed is sent to a collecting duct. This filtrate contains more of dissolved nitrogenous wastes ie, urea and hence it is termed as urine. From here the urine enters the ureter and is collected in urinary bladder.



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