

- Q1.** Name the following:
- (a) The process in plants that links light energy with chemical energy.
 - (b) Organisms that can prepare their own food.
 - (c) The cell organelle where photosynthesis occurs.
 - (d) Cells that surround a stomatal pore.
 - (e) Organisms that cannot prepare their own food.
 - (f) An enzyme secreted from gastric glands in stomach that acts on proteins.
- Q2.** "All plants give out oxygen during day and carbon dioxide during night". Do you agree with this statement? Give reason.
- Q3.** How do the guard cells regulate opening and closing of stomatal pores?
- Q4.** Two green plants are kept separately in oxygen free containers, one in the dark and the other in continuous light. Which one will live longer? Give reasons.
- Q5.** If a plant is releasing carbon dioxide and taking in oxygen during the day, does it mean that there is no photosynthesis occurring? Justify your answer.
- Q6.** Why do fishes die when taken out of water?
- Q7.** Differentiate between an autotroph and a heterotroph.
- Q8.** Is 'nutrition' a necessity for an organism? Discuss.
- Q9.** What would happen if green plants disappear from earth?
- Q10.** Leaves of a healthy potted plant were coated with vaseline. Will this plant remain healthy for long? Give reasons for your answer.
- Q11.** How does aerobic respiration differ from anaerobic respiration?
- Q12.** Match the words of Column (A) with that of Column (B).
- | Column (A) | Column (B) |
|---------------|----------------------------|
| (a) Phloem | (i) Excretion |
| (b) Nephron | (ii) Translocation of food |
| (c) Veins | (iii) Clotting of blood |
| (d) Platelets | (iv) Deoxygenated blood |
- Q13.** Differentiate between an artery and a vein.
- Q14.** What are the adaptations of leaf for photosynthesis?
- Q15.** Why is small intestine in herbivores longer than in carnivores?
- Q16.** What will happen if mucus is not secreted by the gastric glands?
- Q17.** What is the significance of emulsification of fats?

Q18. Match Group (A) with Group (B).

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

Q19. Why does absorption of digested food occur mainly in the small intestine?

Q20. What causes movement of emulsification of fats?

Q21. Why is the rate of breathing in aquatic organisms much faster than in terrestrial organisms?

Q22. Why is blood circulation in human heart called double circulation?

Q23. What is the advantage of having four chambered heart?

Q24. Mention the major events during photosynthesis.

Q25. In each of the following situations what happens to the rate of photosynthesis?

(a) Cloudy days	(b) No rainfall in the area
(c) Good manuring in the area	(d) Stomata get blocked due to dust

Q26. Name the energy currency in the living organism. When and where is it produced?

Q27. What is common for cuscuta, ticks and leeches?

Q28. Explain the role of mouth in digestion of food.

Q29. What are the functions of gastric glands present in the wall of the stomach?

Q30. Match the terms in Column (A) with those in Column (B).

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

Q31. Name the correct substrates for the following enzymes

(a) Trypsin	(b) Amylase	(c) Pepsin	(d) Lipase
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Q32. Why do veins have thin walls as compared to arteries?

Q33. What will happen if platelets were absent in the blood?

Q34. Plants have low energy needs as compared to animals. Explain.

Q35. Why and how does water enter continuously into the root xylem?

Q36. Why is transpiration important for plants?

Q37. How do leaves of plants help in excretion?

Q38. Explain the process of breathing in man.

Q39. Explain the importance of soil for plant growth.

Q40. Describe the alimentary canal of man.

Q41. Explain the process of nutrition in *Ameoba*.

Q42. Draw the diagram of alimentary canal of man and label the following parts.

Mouth, Oesophagus, Stomach, Intestine.

Q43. How do carbohydrates, proteins and fats get digested in human beings?

Q44. Explain the mechanism of photosynthesis.

Q45. Explain the three pathways of breakdown in living organisms.

Q46. Describe the flow of blood through the heart of human beings.

Q47. Describe the process of urine formation in kidneys.

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- S1.** (a) Photosynthesis (b) Autotrophs (c) Chloroplast
(d) Guard Cells (e) Heterotrophs (f) Pepsin
- S2.** During day time, as the rate of photosynthesis is more than the rate of respiration, the net result is evolution of oxygen. At night there is no photosynthesis, so they give out carbon dioxide due to respiration.
- S3.** The swelling of guard cells due to absorption of water causes opening of stomatal pores while shrinking of guard cells closes the pores. Opening and closing of stomata occurs due to turgor changes in guard cells. When guard cells are turgid, stomatal pore is open while in flaccid conditions, the stomatal aperture closes.
- S4.** Plant kept in continuous light will live longer, because it will be able to produce oxygen required for its respiration by the process of photosynthesis.
- S5.** Release of CO_2 and intake of O_2 gives evidence that either photosynthesis is not taking place or its rate is too low. Normally during day time, the rate of photosynthesis is much more than the rate of respiration. So, CO_2 produced during respiration is used up for photosynthesis hence CO_2 is not released.
- S6.** Fishes respire with the help of gills. Gills are richly supplied with blood capillaries and can readily absorb gaseous oxygen they die soon after they are taken out of water.

S7.

Autotroph	Heterotroph
1. Organisms that prepare their own food.	1. Organisms that are dependent on other organisms for food.
2. They have chlorophyll.	2. They lack chlorophyll.

- S8.** Food is required for the following purposes
- (a) It provides energy for the various metabolic processes in the body.
(b) It is essential for the growth of new cells and repair or replacement of worn out cells.
(c) It is needed to develop resistance against various diseases.
- S9.** Green plants are the sources of energy for all organisms. If all green plants disappear from the earth, all the herbivores will die due to starvation and so will the carnivores.
- S10.** This plant will not remain healthy for a long time because
- (a) it will not get oxygen for respiration.
(b) it will not get carbon dioxide for photosynthesis.
(c) Upward movement of water and minerals would be hampered due to lack of transpiration.

S11.

Aerobic respiration	Anaerobic respiration
1. Oxygen is utilised for the breakdown of respiratory substrate.	1. Oxygen is not required.
2. It takes place in cytoplasm (glycolysis) and inside mitochondria (Krebs cycle)	2. It takes place in cytoplasm only.
3. End products are carbon dioxide and water.	3. End products are lactic acid or ethanol and carbon dioxide.
4. More energy is release.	4. Less energy is released.

- S12. (a) (ii) (b) (i) (c) (iv) (d) (iii)

S13.	Aerobic respiration	Anaerobic respiration
	<ol style="list-style-type: none"> 1. Have thick elastic, muscular walls. 2. Lumen is narrow. 3. Carry blood from heart to all body parts. 4. Carry oxygenated blood (except pulmonary artery). 	<ol style="list-style-type: none"> 1. Have thin, non-elastic, walls. 2. Lumen is wide. 3. Carry blood from all body parts to heart. 4. Carry deoxygenated blood (except pulmonary vein).

- S14. (a) Leaves provide large surface area for maximum light absorption.
 (b) Leaves are arranged at right angles to the light source in a way that causes overlapping.
 (c) The extensive network of veins enables quick transport of substances to and from the mesophyll cells.
 (d) Presence of numerous stomata for gaseous exchange.
 (e) The chloroplasts are more in number on the upper surface of leaves.
- S15. Digestion of cellulose takes a longer time. Hence, herbivores eating grass need a longer small intestine to allow complete digestion of cellulose. Carnivorous animals cannot digest cellulose, hence they have a shorter intestine.
- S16. Gastric glands in stomach release hydrochloric acid, enzyme pepsin and mucus. Mucus protects the inner lining of stomach from the action of hydrochloric acid and enzyme pepsin. If mucus is not released, it will lead to erosion of inner lining of stomach, leading to acidity and ulcers.
- S17. Fats are present in food in the form of large globules which makes it difficult for enzymes to act on them. Bile salts present in bile break them down mechanically into smaller globules which increases the efficiency of fat digesting enzymes.
- S18. (a) (iv) (b) (iii) (c) (i) (d) (ii)
- S19. Maximum absorption occurs in small intestine because
 (a) digestion is completed in small intestine.
 (b) inner lining of small intestine is provided with villi which increases the surface area for absorption.
 (c) wall of intestine is richly supplied with blood vessels (which take the absorbed food to each and every cell of the body).
- S20. The wall of alimentary canal contains muscle layers. Rhythmic contraction and relaxation of these muscles pushes the food forward. This is called peristalsis, which occurs all along the gut.
- S21. Aquatic organisms like fishes obtain oxygen from water present in dissolved state through their gills. Since the amount of dissolved oxygen is fairly low compared to the amount of oxygen in the air, the rate of breathing in aquatic organisms is much faster than that seen in terrestrial organisms.
- S22. 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.
- S23. In four chambered heart, left half is completely separated from right half by septa. This prevents oxygenated and deoxygenated blood from mixing. This allows a highly efficient supply of oxygenated blood to all parts of the body. This is useful in animals that have high energy needs, such as birds and mammals.
- S24. The major events during photosynthesis are:
 (a) absorption of light energy by chlorophyll. (b) conversion of light energy to chemical energy.
 (c) splitting of H_2O into H_2 , O_2 and e^- . (d) reduction of CO_2 to carbohydrates.

S25. (a) Decreases (b) Decreases (c) Increases (d) Decreases

S26. Adenosine triphosphate (ATP) produced during respiration in living organisms and also during photosynthesis in plants.

S27. All are parasites, they derive nutrition from plants or animals without killing them.

S28. (a) Food is crushed into small pieces by the teeth.
(b) It mixes with saliva and the enzyme amylase (found in saliva) breaks down starch into sugars.
(c) Tongue helps in thorough mixing of food with saliva.

S29. (a) Production of pepsin enzyme that digests proteins.
(b) Secretion of mucus for protection of inner lining of stomach.

S30. (a) (i) (b) (iv) (c) (ii) (d) (iii)

S31. (a) Protein (b) Starch (c) Protein (d) Fats

S32. Arteries carry blood from the heart to various organs of the body under high pressure so they have thick and elastic walls. Veins collect the blood from different organs and bring it back to the heart. The blood is no longer under pressure so the walls are thin with valves to ensure that blood flows only in one direction.

S33. In the absence of platelets, the process of clotting will be affected.

S34. Plants do not move. In a large plant body there are many dead cells like sclerenchyma as a result it requires less energy as compared to animals.

S35. Cells of root are in close contact with soil and so actively take up ions. The ion-concentration, increases inside the root and hence osmotic pressure increases the movement of water from the soil into the root which occurs continuously.

S36. Transpiration is important because
(a) it helps in absorption and upward movement of water and minerals from roots to leaves
(b) it prevents the plant parts from heating up.

S37. Many plants store waste materials in the vacuoles of mesophyll cells and epidermal cells. When old leaves fall, the waste materials are excreted along with the leaves.

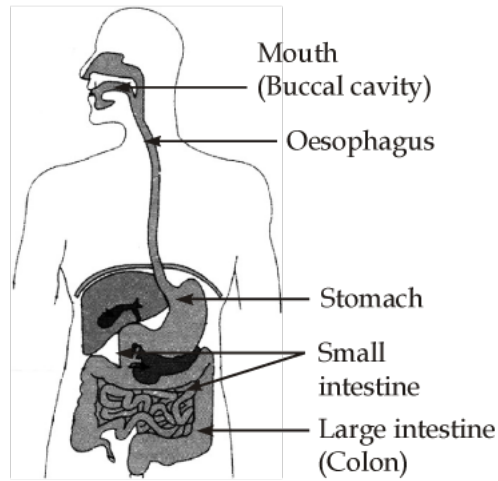
S38. Hints: 1. Anchoring the plant.
2. Source of water and minerals.
3. Availability of oxygen for respiration of root cells.
4. Symbiotic association with microbes.

S39. Hints: 1. Passage of air.
2. Gaseous exchange.
3. Role of diaphragm
4. Function of rib muscles and alveoli.

S40. Hints: Mouth cavity.
Oesophagus.
Stomach.
Intestine.

S41. Hints: Ginger like projections.
Food vacuoles.
Diffusion of simpler substance.

S42.



Alimentary canal of man

S43. Hints: Mouth cavity.
Stomach.
Intestine.

S44. Hints: Absorption of light energy by chlorophyll.
Conversion of light energy into chemical energy.
Reduction of CO_2 into carbohydrates.

S45. Hints: Pyruvate to ethanol, CO_2 and energy.
Pyruvate to lactic acid and energy.
Pyruvate to CO_2 , H_2O and energy.

S46. Hints: Atrium.
Ventricles.
Oxygenated blood.
De-oxygenated blood.

S47. Hints: Nephrons.
Filtration.
Selective reabsorption.

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