

Class 10 Nutrition Important questions

- 1- What are nutrients?
- 2- What is the importance of nutrients?
- 3- What is autotrophic nutrition?
- 4- What is heterotrophic nutrition?
- 5- Why are green plants called producers?
- 6- What is photosynthesis?
- 7- What are the raw materials required for photosynthesis?
- 8- From where do the green plants get carbon dioxide?
- 9- How do green plants get water?
- 10- Why are minerals essential in photosynthesis?
- 11- How do plants obtain minerals?
- 12- Give account of the reaction of the photosynthetic reaction?
- 13- How do the plants obtain carbon dioxide and water?
- 14- Name the different types of heterotrophic nutrition?
- 15- What is holozoic nutrition?
- 16- What are saprotrophs?
- 17- Name two parasitic plants?
- 18- How are all plants and animals dependent on green plants?
- 19- What are the steps involved in holozoic nutrition?
- 20- Write short notes on absorption?
- 21- What type of nutrition is shown in amoeba? What does its diet include?
- 22- How is food digested in amoeba?
- 23- Describe the digestion of food in the small intestine?
- 24- What is the function of large intestine in the human digestive system?
- 25- What is the role played by the liver in addition to the digestion of food?

HINTS AND SOLUTIONS

- 1- Nutrients are various organic and inorganic substances required by the organism to carry out their functions.
- 2- The various nutrients carry out different functions such as:
 - (a) Energy production
 - (b) Synthesis of materials for growth and repair of tissues
 - (c) Synthesis of materials for carrying out and maintaining life functions
 - (d) Synthesis of materials for immune system.
- 3- The process by which the organisms synthesis their own food using carbon dioxide and water is called autotrophic nutrition. For example, green plants, sulphur bacteria, etc.
- 4- The process of nutrition where the organisms obtain their food from other organisms. For example, most of the bacteria, fungi and all animals. They are all dependent on autotrophs directly or indirectly.
- 5- The green plants trap the sun's energy and the raw materials in food molecules. They form the basis of sustenance for all the organisms directly or indirectly. They are also called the producers as they produce food for all other organisms.
- 6- Photosynthesis is a process which utilizes carbon dioxide and water in the presence of sunlight and chlorophyll to synthesize carbohydrates like glucose.
- 7- Photosynthesis requires the radiant energy of the sun, chlorophyll, carbon dioxide, water and minerals.
- 8- Many processes like respiration, combustion, volcanic activity, etc. release carbon dioxide into the atmosphere. This carbon dioxide of the atmosphere is used by the terrestrial plants and the hydrophytes use the carbon dioxide dissolved in the water.
- 9- Water is absorbed by the roots of the green plants from the surrounding soil.
- 10- Minerals like magnesium form essential compounds such as chlorophyll. Hence, they are important for photosynthesis.
- 11- Plants obtain the minerals from the soil by their dissolution in water.
- 12- The reactants of photosynthesis are:

Carbon Dioxide: During photosynthesis, carbon dioxide is converted into carbohydrates and this is called fixing of carbon dioxide. The carbon dioxide of the atmosphere is used by the terrestrial plants whereas the hydrophytes use the carbon dioxide dissolved in the water.

Water: During photosynthesis, hydrogen of water is used to fix carbon dioxide and its oxygen is released. Water is obtained through the root hairs by absorption.

Chlorophyll: They are pigments capable of absorbing radiant energy of the sun. There are two types of photosynthetic pigments- chlorophyll and carotenoids. Chlorophyll is the main pigments as they are involved in the conversion of light energy into chemical energy. The carotenoids also absorb light energy but they pass it to the chlorophyll molecules.

Radiant Energy: The radiant energy from the sun is the source of both light and heat energy for photosynthesis. Light energy is harvested by the pigments in order to carry out the breaking down of water molecule into hydrogen and oxygen. The temperature required by the enzymes to function is maintained by the heat energy of the sun.

Minerals like magnesium are essential as they form the structure of the pigment molecules. Minerals are obtained through water on form of dissolved salts.

13- Carbon dioxide is obtained from the atmosphere through the stomata that are present on the leaves. Water is drawn from the soil by the root of the plant and then transported to the leaves through the vascular bundles.

14- Heterotrophic nutrition is broadly classified as holozoic, saprotrophic and symbiotic.

15- The nutrition that involves the taking in of solid or liquid (in case of fluid feeders) particles of food which have to be further broken down into simpler particles inside the organism. These particles may be big or small.

16- Saprotrophs are organisms that feed on dead and decaying matter. They secrete substances that decompose the dead matter and then take in the food. For example: Rhizopus, musroom, etc.

17- (i) Cuscuta

(ii) Viscum

18- The green plants are fed on by the herbivores which in turn by carnivores. Ultimately, the decomposers derive their nutrition from the dead plants and animals. Thus, all organisms are directly or indirectly dependent on the green plants.

19- Holozoic nutrition involves the following steps:

i. Ingestion- the food is taken in as small or big particles.

ii. Digestion- the food taken in is broken down into a solution form.

iii. Absorption- the digested food is absorbed into the cells and tissues.

iv. Assimilation- the absorbed nutrients are utilized by the cells and tissues for various processes.

v. Egestion- the undigested food is then removed from the digestive tract as faeces.

20- Absorption is taking in of digested food by cells and tissues. This involves the absorption of food in the soluble form from the region of digestion into the tissues or in to where it has to be utilized or into the blood stream which transports it to the different tissues. This takes place through the cell membranes. The absorption may be passive or active. Passive absorption is through diffusion or osmosis without using energy. For example: Water is absorbed by osmosis. Active absorption needs energy. For example, absorption of glucose and sodium ions.

21- Amoeba shows holozoic nutrition. Its diet includes bacteria, microscopic plants like the diatoms, minute algae, and microscopic animals like other protozoa, nematodes and even dead organic matter.

22- Amoeba is a protozoan and holozoic. Since it is a unicellular organism, the digestion is intracellular. The food taken in remains in a food vacuole or gastric vacuole formed by the cell membrane and a bit of the cytoplasm. The vacuoles are transported deeper into

the cells by cytoplasmic movements. Here they fuse with lysosomes that contains enzymes such as amylase and proteinase. Thus, amoeba can digest sugar, cellulose and protein. Fats, however, remain undigested.

23- The first portion of the small intestine, the duodenum gets the pancreatic and the bile juice. The chyme is acted upon by the enzymes and salts present in these two secretions. The starch is converted into maltose by the pancreatic amylase and the remaining proteins, proteoses and peptones into peptides are converted and amino acids by trypsin. The bile juice emulsifies the fats and then converts them into fatty acids and glycerol by the action of lipase.

In jejunum, there is no digestion. In ileum, the food is completely broken down into the simplest of forms e.g. proteins into amino acids and carbohydrates into monosaccharides. This digested mass is now called the chyle and it is in a liquid form.

24- Functions of the large intestine are:

- i. Storage of the undigested food temporarily or temporary storage of undigested food.
- ii. Absorption of water from the undigested food to form solid faeces.
- iii. Facilitation of the egestion of the faeces.

25- Liver carries out the following after the digested food reaches the liver through the blood stream:

- i. Glucose is converted to glycogen and stored.
- ii. Cholesterol is manufactured from some fatty acids.
- iii. The amino acids are used to form required proteins.
- iv. The ammonia produced by the above reaction is converted into the less harmful urea. the latter is then transported through the blood stream to the kidney from where it is excreted.