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Solution 40
(a) Chlorophyll is a green coloured pigment present in the leaves of plants. It helps in absorbing energy from sunlight during the process of photosynthesis.
(b) (i) Glucose(ii) Starch.
Solution 41
(a) The criteria to decide whether something is alive is the movement.
(b) The basic functions performed by living organisms to maintain their life on this earth are called life processes. The basic life processes common to all living organisms are ? Nutrition and Respiration; Transport and Excretion; Control and Coordination; Growth; Movement and Reproduction.
Solution 42
(a) Autotrophs are those organisms which can make their own food from carbon dioxide and water. Example: Green Plants.
(b) The conditions necessary for autotrophic nutrition are sunlight, chlorophyll, carbon dioxide and water.
Solution 43
(a) Those organisms which cannot make their own food from inorganic substances like carbon dioxide and water, and depend on other organisms for their food are called heterotrophs. Example: All Animals.
Autotrophic Nutrition
It is that mode of nutrition in which an organism makes its own food from the simple inorganic materials like carbon dioxide and water present in the surroundings (with the help of sunlight energy). Example: Green Plants.
Heterotrophic Nutrition
It is that mode of nutrition in which an organism cannot make its own food from simple inorganic materials like carbon dioxide and water, and depends on other organisms for its food. Example: Animals.
Solution 44
(a) A nutrient can be defined as a substance which an organism obtains from its surroundings and uses it as a source of energy or for the biosynthesis of its body constituents (like tissues and organs). The four important nutrients present in our food are: carbohydrates, fats, proteins and mineral salts.
(b) The various types of Heterotrophic nutrition are:
(i) Saprotrophic nutrition.
(ii) Parasitic nutrition.
(iii) Holozoic nutrition.
Solution 45
(a) X is sunlight energy and Y is chemical energy.
(b) The photosynthesis takes place in the following three steps;
(i) Absorption of sunlight energy by chlorophyll.
(ii) Conversion of light energy into chemical energy and splitting of water into hydrogen and oxygen by light energy.
(iii) Reduction of carbon dioxide by hydrogen to form carbohydrates like glucose by utilising the chemical energy
Solution 46
(a) Plants obtain food by a process called photosynthesis.
(b) Plants need nitrogen to make proteins and other compounds.

They take up nitrogen from the soil in the form of inorganic salts called nitrates (or nitrites), or in the form of organic compounds which are produced by bacteria from the atmospheric nitrogen.
Solution 47
(i) Saprophytic nutrition: It is that nutrition in which an organism obtains its food from dead organic matter of dead plants, dead animals and rotten bread. Example: Fungi and many bacteria obtain food by saprophytic nutrition.
(ii) Parasitic nutrition: It is that nutrition in which an organism derives its food from the body of another living organism (called its host) without killing it. Example: Plasmodium and round worms obtain food by parasitic nutrition.
(iii) Holozoic nutrition: It is that nutrition in which an organism takes the complex organic food materials into its body by the process of ingestion; the ingested food is digested and then absorbed into the body cells of the organism. Example: Human beings obtain food by holozoic nutrition
Solution 48
(a) Saprophyte: Saprophytes are the organisms which obtain their food from dead plants (like rotten leaves), dead and decaying animal bodies, and other decaying organic matter (like rotten bread). Example: Fungi and some bacteria.
(b) Parasite: A parasite is an organism (plant or animal) which feeds on another living organism called its host. Example: Plasmodium and round worm.
Solution 49
(a) The carbon dioxide gas enters the leaves of the plants through the stomata present on their surface.
(b) The water required by the plants for photosynthesis is absorbed by the roots of the plants from the soil through the process of osmosis. The absorbed water is then transported upward through the xylem vessels to the leaves where it reaches the photosynthetic cells and utilized in photosynthesis.
Solution 50
The gastric juice contains three substances; hydrochloric acid, the enzyme pepsin and mucus.
Functions:
(a) Hydrochloric acid: It makes the medium of gastric juice acidic so that the enzyme pepsin can digest the proteins properly and also kills any bacteria that might have entered the stomach with food.
(b) Pepsin: The enzyme pepsin digests the proteins present in the food and converts them into smaller molecules.
(c) Mucus: The mucus helps to protect the stomach wall from its own secretions of hydrochloric acid.
Solution 51
Pancreatic juice contains digestive enzymes ? Pancreatic Amylase, trypsin and lipase. Functions:
(a) Pancreatic amylase: The enzyme amylase breaks down the starch.
(b) Trypsin: trypsin digests the proteins.
(c) Lipase: Lipase breaks down the emulsified fats.
Solution 52
(a) Hydrochloric acid: It makes the medium of gastric juice acidic so that the enzyme pepsin can digest the proteins properly and also kills any bacteria that might have entered the stomach with food.
(b) Enzymes help in the breaking down of complex organic food materials into simpler forms.
Solution 53
(a) Liver secretes bile which gets stored in the gall bladder. Bile performs two functions:
(i) Makes the acidic food coming from the stomach alkaline so that the pancreatic enzymes can act on it.
(ii) Bile salts breaks the fats present in the food into small globules

making it easy for the enzymes to act and digest them.
(b) Trypsin: It is a pancreatic enzyme present in the pancreatic juice. Its function is to digest the proteins.
Solution 54
Liver secretes bile which helps in the emulsification of fats. Pancreas secretes pancreatic juice which emulsifies starch, proteins and fats.
Solution 55
(i) - (c)
(ii) - (a)
(iii) - (d)
(iv) - (b)
Solution 56
(a) Photosynthesis.
(b) Heterotrophs.
(c) Autotrophs.
(d) Chloroplast.
(e) Guard cells.
(f) Pepsin.
Solution 57
(i) - (c)
(ii) - (d)
(iii) - (a)
(iv) - (b)
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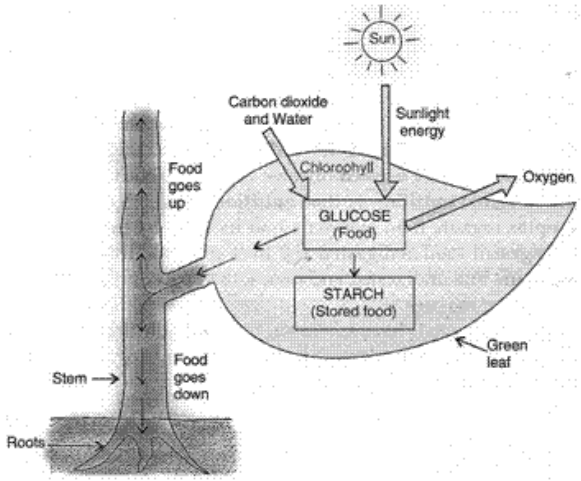
Solution 58
(a) Parasitic mode of nutrition.
(b) (i) Proteins
(ii) Starch
(iii) Proteins
(iv) Fats.
(c) Absorption of digested foods occurs mainly in the small intestine due to the presence of a large number of finger like projections called villi.
Solution 59
(a) Herbivores eat only plants so they need a longer small intestine to allow the cellulose present in the plants to be digested completely.
(b) If mucus is not secreted, hydrochloric acid will cause the erosion of inner lining of stomach leading to the formation of ulcers in the stomach.
(c) The contraction and expansion movements of oesophagus also called peristaltic movements pushes the food down into the elementary canal.
Solution 60
(a) The opening and closing of stomatal pores is controlled by the guard cells, when water flows into the guard cells, they swell, become curved and cause the pore to open whereas when the guard cells lose water, they shrink, become straight and close the stomatal pore. (b) 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.
Solution 61
(a) If all the green plants disappear from the earth, then all the organisms (herbivores, carnivores and omnivores) will die due to starvation as green plants are the source of food for all organisms.
(b) When photosynthesis occurs during the day, the carbon dioxide released by plants by respiration is all used up and not released. Similarly, some of the oxygen produced during photosynthesis is used up in respiration. Since the plant is releasing carbon dioxide and taking in oxygen even during the day, it means that no photosynthesis is taking place.
Solution 62
(a) This plant will not remain healthy for long because vaseline coating closes the stomatal pores on the leaves due to which
(i) plant will not get oxygen for respiration

(ii) plant will not get carbon dioxide for photosynthesis, and
(iii) plant will not get water (and minerals) due to stoppage of transpiration.
(b) (i) Decreases in morning but increases in the afternoon
(ii) Decreases.
(iii) Decreases.
Solution 63
(a) The process by which green plants make their own food (like glucose) from carbon dioxide and water by using sunlight energy in the presence of chlorophyll is called photosynthesis.

(b) $6CO_2$ (Carbon dioxide (From air)) + $6H_2O$ (Water (From soil)) + Light Energy (From sun) $\xrightarrow{\text{Chlorophyll (Photosynthesis)}}$ $C_6H_{12}O_6$ (Glucose (A food)) + $6O_2$ (Oxygen)

(c) The process of photosynthesis takes place in the green leaves of a plant. The carbon dioxide gas required for making food is taken by the plant leaves from the air which enters the leaves through tiny pores called stomata. Water required for making food is taken from the soil which is transported to the leaves from the soil through the roots and the stem. The sunlight provides energy required to carry out the chemical reactions involved in the preparation of food. The green pigment called chlorophyll absorbs sunlight energy. The photosynthesis takes place in three steps:
(i) Absorption of sunlight energy by chlorophyll.
(ii) Conversion of light energy into chemical energy and splitting of water into hydrogen and oxygen by light energy.
(iii) Reduction of carbon dioxide by hydrogen to form carbohydrates like glucose by utilising the chemical energy.



Green plants make their own food by photosynthesis.

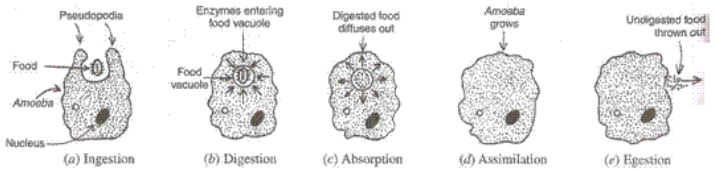
Solution 64
(a) The raw materials for photosynthesis are carbon dioxide and water. The green plants take carbon dioxide from air for photosynthesis. The carbon dioxide gas enters the leaves of the plants through the stomata present on their surface. The water required by the plants for photosynthesis is absorbed by the roots of the plants from the soil through the process of osmosis. The water absorbed by the roots is transported upwards through the xylem vessels to the leaves where it reaches the photosynthetic cells and utilized in photosynthesis.
(b) The conditions for photosynthesis are sunlight, chlorophyll, carbon dioxide and water.
(c) Factors affecting the rate of photosynthesis are
(i) Light
(ii) Carbon dioxide
(iii) Water
(iv) Temperature
(v) Mineral elements.
Solution 65
(a) Nutrition is defined as a process of intake of nutrients (like

carbohydrates, fats, proteins, minerals, vitamins and water) by an organism as well as the utilisation of these nutrients by the organism. Nutrition is necessary for an organism as it provides energy to them from the food they eat. (b) There are mainly two modes of nutrition:
(i) Autotrophic - Autotrophic nutrition is that mode of nutrition in which an organism makes its own food from the simple inorganic materials like carbon dioxide and water present in the surroundings (with the help of sunlight energy). Example: Green plants obtain food by autotrophic nutrition.
(ii) Heterotrophic - Heterotrophic nutrition is that mode of nutrition in which an organism cannot make its own food from simple inorganic materials like carbon dioxide and water, and depends on other organisms for its food. Example: All animals obtain food by heterotrophic nutrition.
(c) The mode of nutrition in
(i) round worm and
(ii) plasmodium is parasitic nutrition.
Solution 66
(a) (i) Herbivores - Those animals which eat only plants are called herbivores. Example: Goat and cow.
(ii) Carnivores - Those animals which eat only other animals as food are called carnivores. Example: Tiger and Lion.
(iii) Omnivores - Those animals which eat both plants and animals are called omnivores. Example: Human Being and dog.
(b)

Lion	Carnivore
Man	Omnivore
Dog	Omnivore
Goat	Herbivore
Crow	Omnivore
Elephant	Herbivore
Snake	Carnivore
Hawk	Carnivore
Rabbit	Herbivore
Deer	Herbivore

(c) The five steps involved in the process of nutrition in animals are
(i) Ingestion
(ii) Digestion
(iii) Absorption
(iv) Assimilation
(v) Egestion.
Solution 67
(a) Nutrition in amoeba: Nutrition in amoeba involves the following steps
(i) Ingestion ? Amoeba has no mouth for ingestion of food. It ingests the food by using its pseudopodia. The food is engulfed with little water to form a food vacuole.
(ii) Digestion ? The food is digested by digestive enzymes present in the cytoplasm which breaks the food into small soluble molecules by chemical reactions.
(iii) Absorption ? The digested food is absorbed directly into the cytoplasm by diffusion. The digested food spreads out from the food vacuole into the whole cell and after absorption the food vacuole disappears.
(iv) Assimilation ? Food is used to obtain energy through respiration and the remaining part of the food is used for growth.
(v) Egestion ? The undigested food collects inside the cell and the cell membrane ruptures. Through this, the undigested food is

thrown out of the body.

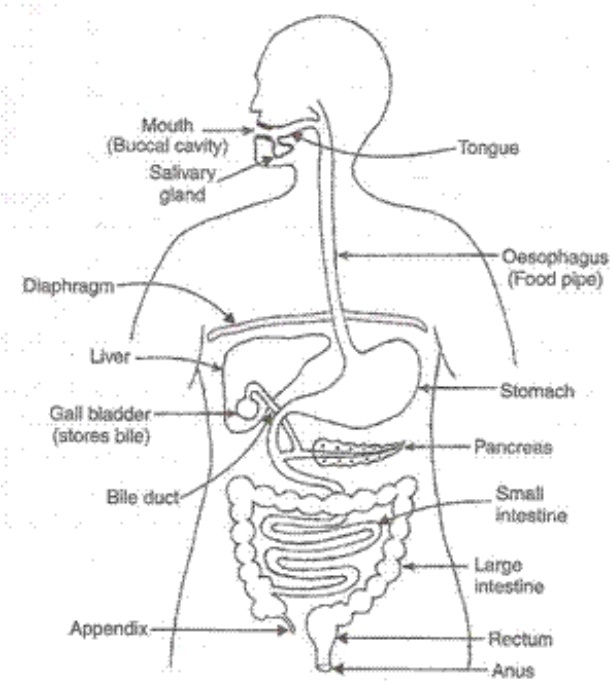


Different stages in the nutrition (feeding) of *Amoeba*.

(b) The mode of nutrition in amoeba is holozoic.
(c) The process of obtaining food is called phagocytosis, which means cell feeding.

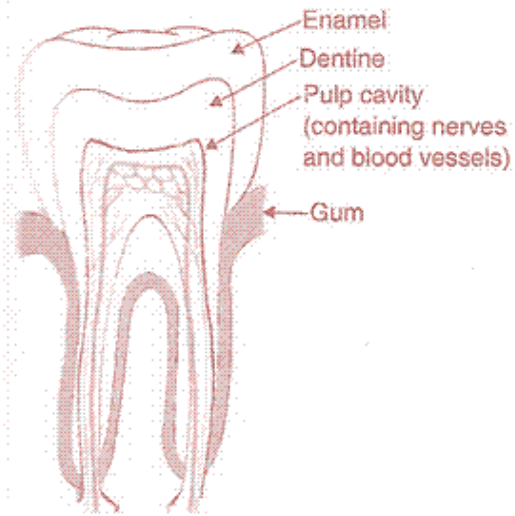
Solution 68

(a) Digestion of food in human beings: Digestion of food begins in the mouth. The mouth cavity contains teeth, tongue and salivary glands. The teeth cut the food into small pieces, chew and grind it. This is called physical digestion. Salivary glands produce saliva which mixes with the food. This involves chemical digestion of food. The saliva contains an enzyme called salivary amylase which digests the starch and converts it into maltose sugar. Mouth opens into a small funnel shaped area called pharynx which leads to a long tube called oesophagus. It carries the food down into the stomach. The wall of oesophagus is muscular. When the slightly digested food enters the food pipe, the walls of the oesophagus starts contraction and expansion movements called peristaltic movements which push the food into the stomach. Digestion does not take place in the oesophagus. The glands present on the walls of the stomach secrete gastric juice that contains hydrochloric acid, the enzyme pepsin and mucus. A small amount of gastric lipase is also present that breaks down the fats present in the food. Gastric juice is acidic due to the presence of HCl which is necessary for the pepsin to become active and converts the proteins into peptones. The mucus protects the stomach walls from HCl. From the stomach, the partially digested food goes into the small intestine through sphincter muscle. Small intestine is divided into two parts: Duodenum and Ileum. Duodenum receives the secretions of two glands, liver and pancreas through a common duct. Liver secretes bile which is alkaline and contains salts to emulsify the fats (or lipids). The bile secreted by the liver is stored in the gall bladder. Pancreas secretes pancreatic juice which contains trypsin, lipase and pancreatic amylase. Trypsin digests the proteins, lipase emulsifies the fats and pancreatic amylase breaks down the starch. Thus, small intestine is the site of complete digestion of carbohydrates, proteins and fats. The walls of ileum secrete succus entericus which completes the digestion process.



The human digestive system.

(b) The walls of small intestine has finger like projections like villi which increases the surface area for absorption.
(c) Peristaltic movements.
Solution 69
(a) The tooth has hard outer covering called enamel. The part of tooth below enamel is called dentine inside which is the pulp cavity. The pulp cavity contains nerves and blood vessels.



Parts of a tooth.

(b) The formation of small cavities (or holes) in the teeth due to the action of acid forming bacteria and improper dental care is called dental caries. This happens as follows: When we eat sugary food, the bacteria in our mouth act on sugar to produce acids. These acids dissolve the calcium salts from the tooth enamel and then from dentine forming small cavities in the tooth over a period of time in our mouth act on sugar to produce acids. These acids dissolve the calcium salts from the tooth enamel and then from dentine forming small cavities in the tooth over a period of time.
(c) If the teeth are not cleaned regularly, they become covered with the sticky, yellowish layer of food particles and bacteria cells called dental plaque. It causes tooth decay. It can be prevented by brushing the teeth regularly as it neutralises the acids.
Solution 70

(a) The various organs of the human digestive system are mouth, oesophagus, stomach, small intestine and large intestine. The glands associated with the human digestive system are salivary glands, liver and pancreas.
(b) (i) Carbohydrates - The digestion of carbohydrates begins in the mouth. The human saliva contains an enzyme called salivary amylase which digests the starch present in the food into maltose sugar. The slightly digested carbohydrates when reaches the small intestine, pancreatic amylase present in the pancreatic juice breaks down the starch. The intestinal juice of the small intestine completes the digestion of carbohydrates and finally coverts it into glucose.
(ii) Fats - The process of digestion of fats begins in the stomach. The glands of stomach secrete a small amount of gastric lipase that breaks down the fats present in the food. From the stomach the partially digested food goes into small intestine where the pancreatic lipase breaks down the emulsified fats. The walls of small intestine secrete intestinal juice which converts the fats into fatty acids and glycerol.
(iii) Proteins - The digestion of proteins begins in the stomach. The glands of the stomach secrete gastric juice which contains an enzyme called pepsin. Pepsin converts the proteins into peptones. Pancreatic juice contains trypsin which digests the proteins into peptides and the intestinal juice completes the process of digestion of proteins thus converting it into amino acids.

********** END **********