

IMPORTANT QUESTIONS CLASS – 11 BIOLOGY

CHAPTER -7 STRUCTURAL ORGANIZATION IN ANIMALS

Question 1.

Enumerate the various functions of epithelial tissue.

Answer:

Function:

1. Protection: It protects the underlying or overlying soft tissues against heat, injury, chemicals, virus and bacteria etc.
2. Absorption: It absorbs the digestive food especially with columnar cells of the intestine.
3. Secretion: The glandular epithelial cells lining the inner cavities secrete various substances like mucous, enzymes and hormones which are necessary for various metabolic activities.
4. Excretion: The epithelial cells of kidney tubules and sweat glands help in the excretion of wastes from the body.
5. Sensation: The nerve ending in the epithelial cells of the retina, olfactory organs and nasal chamber etc. receive the stimuli from the external atmosphere and transfer them to the brain for interpretation.
6. Other functions: The trachea contains the ciliated epithelium to facilitate the transport of mucous and other substances from one part of the body to another. The lungs' epithelium helps in the exchange of gases during respiration and the germinal epithelium of testes and ovaries form the sperms and ova respectively. The epithelium also forms the exoskeleton structure as scales, feathers, hairs, nails, claws, horns etc.

Question 2.

What is a gland? Differentiate between simple and compound exocrine gland.

Answer:

Any organ or structure that secretes specific useful substances is known as a gland.

A gland develops from the epithelium tissues and is generally cubical, short columnar or polyhedral in shape.

1. Simple exocrine gland: Simple exocrine gland has no branch but consists of a single

unbranched duct lined by epithelial cells. The secretory part of the gland also consists of epithelial cells arranged in a simple tube, coiled tube in a flask which send their secretion into a single duct.

So these are simple tubular glands, simple coiled tubular glands and simple alveolar glands respectively.

2. Compound exocrine gland: Compound exocrine gland has a branched system of ducts. The secretory part consists of tubules-Compound tubules, many acini or alveoli-compound alveolar glands or a combination of both tubules and acini-compound tubuloalveolar gland.

Question 3.

What is connective tissue? Give its important functions.

Answer:

Connective tissue is mesodermal in origin and form of matrix, fibres and cells. It constitutes the extracellular ground substance and fills up the intercellular spaces between the cells.

Functions of connective tissue: The connective tissue perform various functions and these are:

1. It serves the function of packing material nearly for all organs.
2. It binds one tissue or organ to another and serves the purpose of a strong elastic rope.
3. It provides skeletal support and shape to the body.
4. It protects the vital organs of the cranial and thoracic cavities, deep blood vessels and nerves from mechanical injuries.
5. The adipose connective tissue stores fat and represent stored energy.
6. It provides defence against foreign particles like bacteria. The phagocytes of leucocytes ingest the bacteria and germs and protect the body against infection.
7. The lymphocytes from the antibodies against the action of antigens and provide immunity to the body.

Question 4.

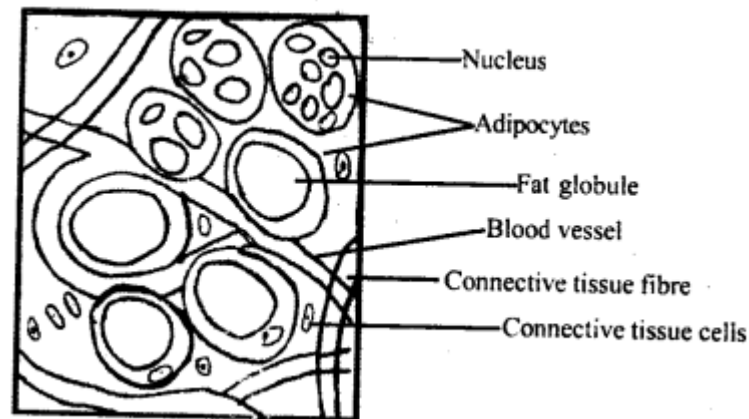
What is adipose tissue? Where does it lie in the human body? Give its important functions.

Answer:

Adipose tissue: It is the specialized form of areolar tissue where it contains fat cells or adipocytes in the matrix. Each fat cell is large, rounded occupied by big fat droplets and its nucleus and cytoplasm are pushed towards the periphery of the cell. This imparts a 'signet' ring-like look to the fat cell.

These fat cells can easily be stained by Sudan III or osmic acid. The matrix is supported by a loose framework of areolar tissue containing fibroblasts, macrophage, white collagen fibres of small size, elastic fibres; lymphatics and blood vessels.

The lactating tissue lies in the subcutaneous tissue of the skin, in the mesentery and in the perinephric and sub periodical tissue of the body. The lactating mammary gland of human also contain abundant amounts of adipose tissue but these are quite lacking in penis, scrotum, eyelids and in the cranial cavity.



Adipose tissue

Functions: It synthesises, stores and metabolises the fat and forms the insulating layer beneath the skin. It collects around the viscera especially kidneys and prevents them from shock and injury.

Question 5.

Plasma contains three classes of proteins. What are these? Give their functions.

Answer:

The major classes of plasma proteins are

1. Albumin,
2. Globulins and
3. Fibrinogen

Functions of Plasma Proteins:

1. The immune bodies are mainly an important constituent of the globulin fraction which provide defence against infection.,
2. Fibrinogen and prothrombin are necessary for the coagulation of blood.
3. The plasma proteins normally have an osmotic effect of 25 mm Hg and thus influence the exchange of fluid between blood and tissue spaces.

4. Plasma proteins mainly globulins are responsible for the viscosity of blood and this help in maintaining peripheral resistance and arterial blood pressure for efficient heart functioning.
5. Plasma, proteins act as buffers in maintaining acid-base balance.
6. Albumin and globulin proteins retain water in the blood plasma by their osmotic effects and their deficiency lead to oedema.
7. Plasma proteins especially the fibrinogen are concerned with erythrocyte sedimentation rate.
8. Plasma proteins help in the transport of certain substances like hormones, enzymes, iron and copper etc. in the blood.
9. Plasma proteins distribute heat uniformly all over the body.

Question 6.

Describe briefly the external features of cockroach.

Answer:

The cockroach is a nocturnal cursorial and omnivorous insect. It is generally reddish-brown in colour and its entire body is covered by tough chitin. Its body is divided into head, thorax and abdomen.

Head: It is somewhat pear-shaped and is six segmented. It lies at a right angle to the body with the broad side upwards. It articulates with the thorax by the flexible neck. On each side of the head is a large compound eye. A pair of antennae articulate In spite close to the notches of the compound eyes.

The top of the head is termed a vertex. Mouthparts are chewing and surrounded by five kinds of appendages. These include, the labrum, mandibles, first maxillae, second maxillae and hypopharynx. The neck is slender, flexible and supported by chitinous cervical plates.

Thorax: The thorax consists of three segments – Prothorax, mesothorax and metathorax. Each segment of the thorax is covered by four sclerites. There is a tergum on the dorsal side, a sternum on the ventral side and a pleuron on either lateral side.

The thorax bears three pairs of jointed walking legs, a pair per segment and two pairs of wings in meso and metathorax. Each leg is made of a number of parts-coxa; the trochanter, femur, tibia and tarsus. Their leg is made of a number of parts coxa, trochanter, femur, tibia and tarsus: They are formed as lateral expansions of the

(a) External features of cockroach

integument between the tergum and the pleuron. Each wing is supported by a network of hollow veins. The mesothorax wings are narrow, thick, opaque and leathery and not used in flight.

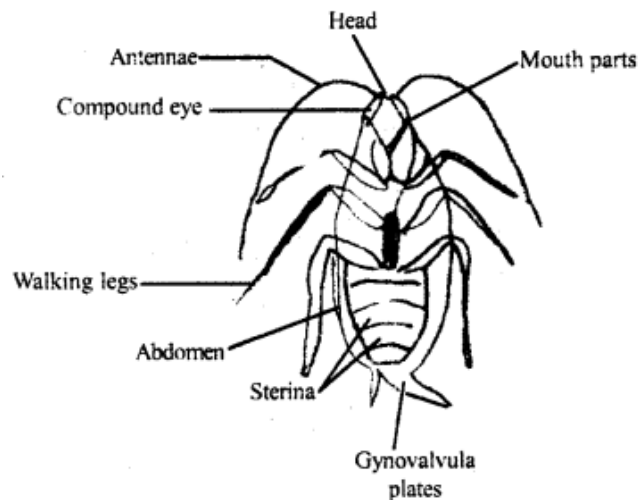
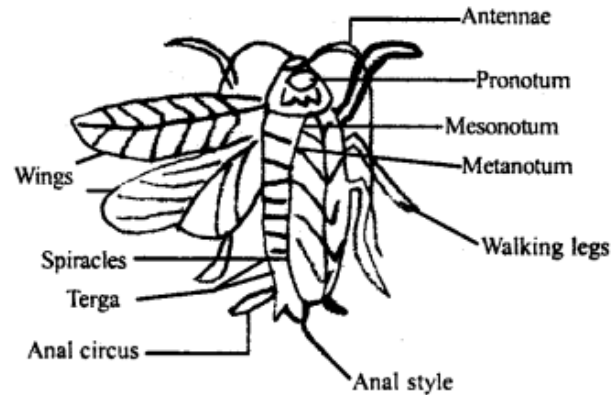
Head

(b) External features of cockroach

Abdomen: The abdomen is ten segmented and covered by four sclerites. There are all ten-terga, but 9th terga of the male and 8th and 9th terga of the female are covered by 7th tergum. In the female-only the first seven sterna are visible, the seventh, eighth and ninth sterna together form a brood pouch.

The 10th tergum bears a pair of a long tapering structure called anal cerci. In male 9th sternum bears a pair of short unjointed anal styles. They are absent in females. The gonapophyses are very small, irregular arising from the 9th sternum in the male and from the eighth and ninth sterna in the female.

At the posterior end of the abdomen, below the tenth terga, is situated the anus. There, are ten pairs of spiracles on the lateral sides of the body, two on the thorax, eight on the abdomen.



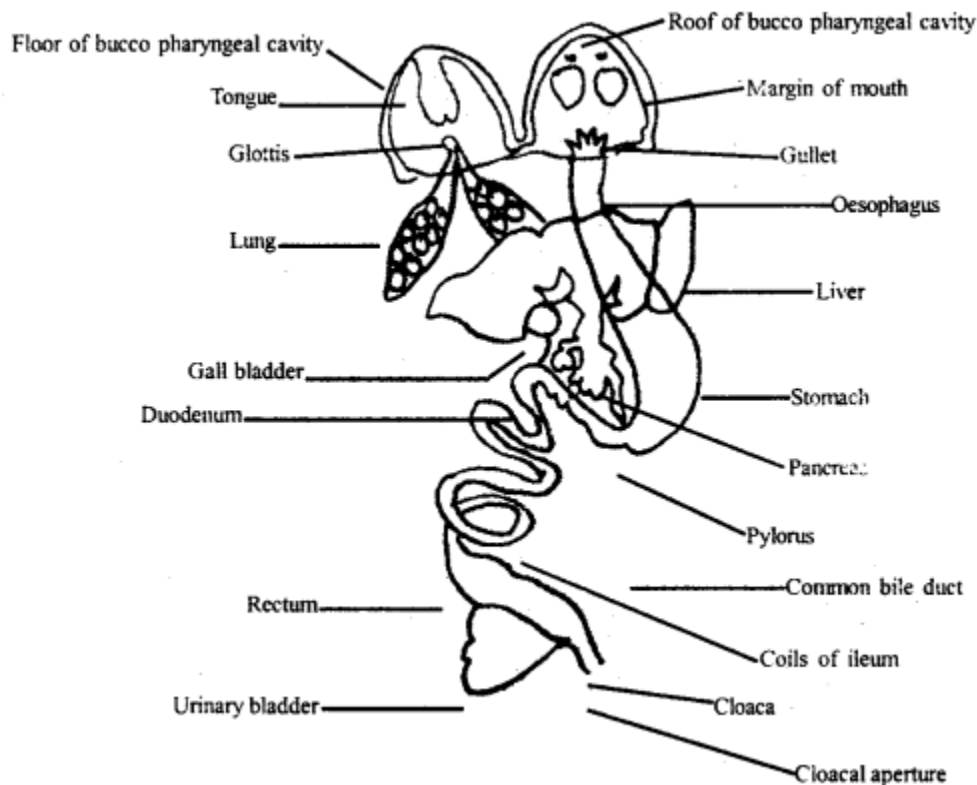
Question 7.

Describe briefly the alimentary canal and digestive glands of the frog.

Answer:

The alimentary canal of the frog is short. It starts with a mouth that is terminal in position. It opens into the buccopharyngeal cavity which contains the maxillary and vomerine teeth and carries the openings of the eustachian tube, vocal sac, gullet and glottis. The gullet opens in a narrow and short tubed Oesophagus which continues in the large stomach. Stomach walls are highly muscular that help in converting the food into chyme.

The stomach is followed by a coiled small intestine. The small intestine bears a number of finger-like folds called villi and microvilli which increase the surface area for absorption of digested food. Intestine continues into a wider section, opening into the cloaca. The urinary bladder opens into the cloaca. The urinary opens into the cloacal chamber through the ureter.



Alimentary canal and digestive glands of the frog

The gastric glands of the stomach bring about the digestion of protein. The liver secretes bile that is temporarily stored in the gall bladder. Bile helps in the digestion of food by changing its pH from acidic to alkaline and by emulsifying the fat. The liver does not secrete any enzyme. The pancreas is situated in a thin mesentery and lies parallel to the stomach.

It secretes pancreatic juice that causes the digestion of protein starch and fats with the help of trypsin, amylase and lipase. Similarly, intestinal juices with their peptidases, lipase and sugar enzymes bring about the digestion of peptides, fats and sugars.

Question 8.

Describe briefly the blood vascular system of the cockroach.

Answer:

The cockroach has an open circulatory system. Blood is colourless and contains plasma with colourless cells, the leucocytes. It does not contain haemoglobin and thus, plays no role in respiration.

The heart is thirteen chambered which is long, narrow, muscular and tube-like structure. The three chambers of the heart lie in the thorax and ten in the abdomen. The posterior end is closed and the anterior end is continued forwards as the anterior aorta. It opens into a

haemocoel in the head.

There is a small hole, the Ostia at the posterior side of each chamber. Ostia is guided by valves to allow blood flow only in one direction i.e., from the haemocoel to the inner chamber of the heart.

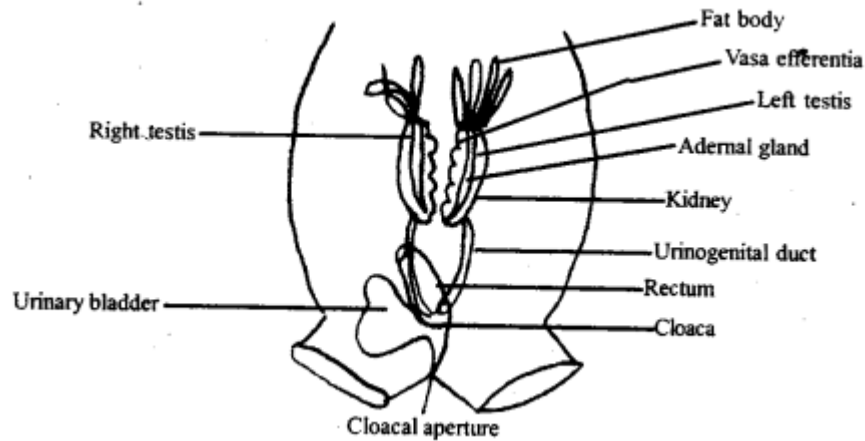
All the visceral organs are bathed in blood. It consists of a colourless liquid part, plasma containing many corpuscles called haemocytes.

Question 9.

Describe the male reproductive organs in the frog.

Answer:

It consists of a pair of the yellowish testis that is attached to the upper part of the kidneys by a double fold of peritoneum called mesorchium.



Reproductive organs of the male frog

Each testis contains about 10 to 12 vasa efferentia that run through the mesorchium and enter the kidneys of their side. In kidneys, these open into the bidder's canal that finally joins with the urinogenital ducts. This cones of the kidneys and finally opens into the cloaca. The cloaca is a small, medium chamber that is used to pass faecal matter, urine and sperms to the exterior.

Question 10.

Describe the alimentary canal of an earthworm and interactions with mankind.

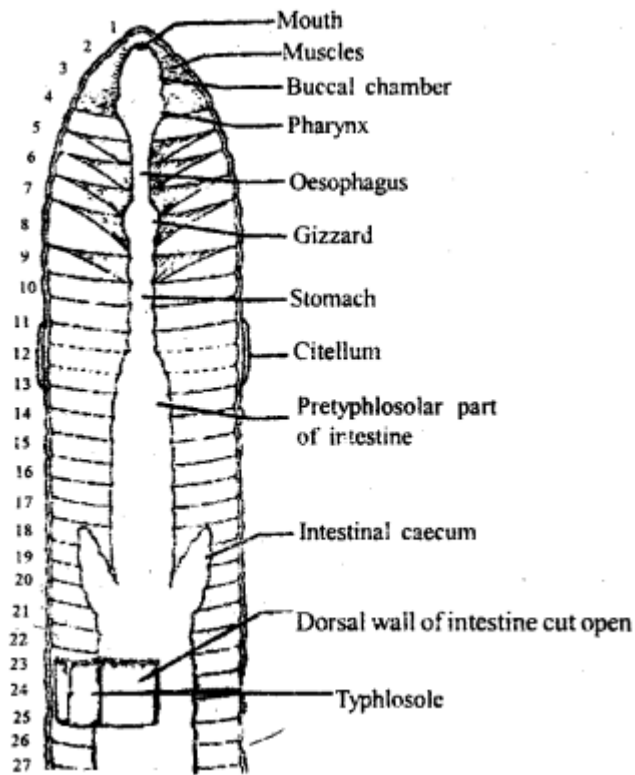
Answer:

Alimentary canal of earthworm: Alimentary canal is a straight tube starting from 1st segment to the last segment of the body. It consists of the mouth, buccal cavity, pharynx, oesophagus, gizzard, stomach, intestine and anus. The mouth lies in the first segment.

The mouth opens into the buccal cavity (1 – 3 segment). The buccal cavity leads into the pharynx. The pharynx leads into the oesophagus which is continued into the gizzard. The stomach extends from the 9th to 14th segment. The intestine starts from the 15th segment and continues up to the last segment. The alimentary canal opens to the outside by an aperture called the anus.

Interaction of earthworm with mankind:

1. Earthworms are the friends of farmers. They make burrows in the soil and make it porous to facilitate respiration and penetration of plant root. Earthworm increases the fertility of the soil by vermicomposting.
2. In China, Japan, Burma, Australia, earthworms are used for food.
3. Earthworms are used as bait for game fishing.
4. In India, earthworms are used for the treatment of stones, jaundice, piles, diarrhoea.
5. Earthworms also cause harm by making burrows in the land (damage tender plant).



Alimentary canal of the earthworm