

MULTIPLE CHOICE QUESTIONS

1. Which one of the following types of cell is involved in making of the inner walls of blood vessels?

- a. Cuboidal epithelium**
- b. Columnar epithelium**
- c. Squamous epithelium**
- d. Stratified epithelium**

Solution:

Option (c) is the answer.

2. To which one of the following categories does adipose tissue belong?

- a. Epithelial**
- b. Connective**
- c. Muscular**
- d. Neural**

Solution:

Option (b) is the answer.

3. Which one of the following is not a connective tissue?

- a. Bone**
- b. Cartilage**
- c. Blood**
- d. Muscles**

Solution:

Option (d) is the answer.

4. Setae help in locomotion in earthworm but are not uniformly present in all the segments. They are present in

- a. 1st segment**
- b. Last segment**
- c. Clitellar segment**
- d. 20th - 22nd segment**

Solution:

Option (b) is the answer.

5. Which one of the following statements is true for cockroach?

- a. The number of ovarioles in each ovary is ten.**
- b. The larval stage is called caterpillar**
- c. Anal styles are absent in females**
- d. They are ureotelic**

Solution:

Option (d) is the answer.

6. Match the following and choose the correct option

Column I A. Adipose tissue B. Stratified epithelium C. Hyaline cartilage D. Fluid connective tissue	Column II i. Nose ii. Blood iii. Skin iv. Fat storage
--	--

Options:

- a. A-i, B-ii, C-iii, D-iv
- b. A-iv, B-iii, C-i, D-ii
- c. A-iii, B-i, C-iv, D-ii
- d. A-ii, B-i, C-iv, D-iii

Solution:

Option (b) is the answer.

7. Match the following and choose the correct option

Column I A. Hermaphrodite B. Direct development C. Chemoreceptor D. Blood gland in earthworm	Column II i. Produces blood cells and haemoglobin ii. Testis and ovary in the same animal iii. Larval form absent iv. Sense of chemical substances
---	---

Options:

- a. A-ii, B-iii, C-iv, D-i
- b. A-iii, B-ii, C-iv, D-i
- c. A-i, B-iii, C-ii, D-i
- d. A-ii, B-iv, C-iii, D-i

Solution;

Option (a) is the answer.

8. Match the following with reference to cockroach and choose the correct

Option

Column I A. Phallomere B. Gonopore C. Spermatophore D. Ovarioles	Column II i. Chain of developing ova ii. Bundles of sperm iii. Opening of the ejaculatory duct iv. The external genitalia
---	--

Options:

- a. A-iii, B-iv, C-ii, D-i
- b. A-iv, B-iii, C-ii, D-i
- c. A-iv, B-ii, C-iii, D-i
- d. A-ii, B-iv, C-iii, D-i

Solution:

Option (b) is the answer.

9. Match the following and choose the correct option

Column I	Column II
-----------------	------------------

A. Touch B. Smell C. Cranial nerves D. Medulla oblongata	i. Nasal epithelium ii. Foramen magnum iii. Sensory papillae iv. Peripheral nervous system
---	---

Options:

- a. A-iii, B-i, C-ii, D-iv
- b. A-ii, B-i, C-iv, D-iii
- c. A-iii, B-iv, C-ii, D-i
- d. A-iii, B-i, C-iv, D-ii

Solution:

Option (d) is the answer.

VERY SHORT ANSWER TYPE QUESTIONS

1. State the number of segments in earthworm which are covered by a prominent dark band or clitellum.

Solution:

The 14th, 15th and 16th number of the segment in earthworms are covered by prominent dark band or clitellum as it has a tissue known as clitellum.

2. Where are sclerites present in cockroach?

Solution:

Sclerites are present in all the body segments of cockroaches. The sclerites are hard chitinous plates present in an insect.

3. How many times do nymphs moult to reach the adult form of a cockroach?

Solution:

A nymph requires to moult 13 times to reach the adult cockroach form.

4. Identify the sex of a frog in which sound-producing vocal sacs are present.

Solution:

Sound producing vocal sacs are present in Male frogs only. They are used for amplifying their mating calls to attract female frogs. They are absent in female frogs.

5. Name the process by which a tadpole develops into an adult frog.

Solution:

The process by which a tadpole develops into an adult frog is known as metamorphosis.

6. What is the scientific term given to earthworm's body segments?

Solution:

The earthworm's body segmentation is known as metamerism. It is important for its locomotion.

7. A muscle fibre tapers at both ends and does not show striations. Name the muscle fibre.

Solution:

Smooth muscle fibres can taper at both ends and does not show any striations. Smooth muscles functioning cannot be controlled directly.

8. Name the different cell junctions found in tissues.

Solution:

Adhering junction, Gap junction and Tight junction are the cell junctions found in tissues.

9. Give two identifying features of an adult male frog.

Solution:

- i) Presence of vocal sacs: The male frogs have saggy skinned vocal sacs in their necks
- ii) Presence of Copulation pad: The male frogs have a copulatory pad on the forelimbs

10. Which mouth part of cockroach is comparable to our tongue?

Solution:

Hypopharynx is the mouth part of cockroach which is comparable to our tongue.

11. The digestive system of the frog is made of the following parts. Arrange them in an order beginning from the mouth. Mouth, oesophagus, buccal cavity, stomach, intestine, cloaca, rectum, cloacal aperture

Solution:

Mouth Buccal cavity Oesophagus Stomach Intestine Rectum Cloaca Cloacal aperture is the order.

12. What is the difference between cutaneous and pulmonary respiration?

Solution:

Cutaneous respiration refers to the exchange of gases which occurs through the from the skin while pulmonary respiration refers to the exchange of gases through the lungs.

13. The special venous connection between liver and intestine and between kidney and intestine is found in the frog, what are they called?

Solution:

The special venous connection between the liver and intestine is known as the hepatic portal system and between kidney and intestine is known as the renal portal system.

SHORT ANSWER TYPE QUESTIONS

1. Give the location of hepatic caeca in a cockroach. What is their function?

Solution;

The hepatic caeca which are also known as gastric caeca is a 6-8 narrow and hollow ring-like blind tubules which are present in the junction of the foregut and midgut. They help in the digestion of food in cockroaches.

2. Frogs are beneficial for mankind, justify the statement.

Solution:

They are an important part of the food chain. They help farmers by eating insects and pest and protect from insect infection. They are also used as a food source for humans in some regions of the world. For experiments and researches, they have been used.

3. The body of sponges does not possess tissue level of organisation though it is made of thousands

of cells. Comment.

Solution:

Most of the multicellular organisms possess specialized or advanced tissue level but sponges have a cellular tissue level. They do not form tissues and their bodies perforated which allows water to pass through them easily.

4. Structural organisation in animals attains different levels as cell - organ - organ system. What is missing in this chain? Mention the significance of such an organisation.

Solution:

the issue is missing in the given chain. It should be cell – tissue — organ – organ system. A tissue is a collection of similar types of cells which together forms an organ and these organs form an organ system.

5. Stratified epithelial cells have a limited role in secretion. Justify their role in our skin.

Solution:

Stratified epithelial cells help in the protection of the dry skin. It has multi-layers and thus does not have much role in secretion.

6. How does a gap junction facilitate intercellular communication?

Solution:

It occurs by the communication between two cells bypassing of small signalling molecules from one cytoplasm to adjacent cytoplasm.

7. Why are blood, bone and cartilage called connective tissue?

Solution:

They have a role in the binding and connection of different tissues and organs. They help in providing structural rigidity, support and protection of the body. They help in the transport and exchange of various enzymes, hormones, gases and molecules such as nitrogenous wastes, vitamins, etc.

8. Why are neurons called excitable cells? Mention special features of the membrane of the neuron?

Solution:

Neurons are called excitable cells because they have an electrical potential difference

1. During the resting stage of the neuron, it has a sodium-potassium ion pump (i.e., Na^+ - K^+ ion pump).
2. A change in the potential difference spread changes in the entire neuron
3. Stimulus is normally obtained in a place known as trigger zone in which sodium ions (i.e., Na^+ ions) are abundantly present.

9. Why earthworm is called the friend of a farmer?

Solution:

The earthworm is called a friend of farmers because they help farmers by moving through the soil which helps in aeration of the soil. The excreta which is released by them helps in increasing the fertility of the soil.

10. How do you distinguish between dorsal and ventral surface of the body of earthworm?

Solution:

The dorsal surface of the body of earthworm has a dark dorsal median line than the ventral surface of the body of earthworm.

11. Correct the wrong statements among the following:

- In earthworm, a single male genital pore is present.
- Setae help in locomotion of earthworm.
- Muscular layer in the body wall of an earthworm is made up of only circular muscles.
- Typhlosole is the part of the intestine of earthworm.

Solution:

a. Wrong statement.

In earthworms, there is the presence of a pair of the male genital pore.

b. Correct statement

c. Wrong statement

The muscular layer in the body wall of the earthworm is not only made up of circular muscles but it also has longitudinal muscles.

d. Correct statement.

12. Why nephridia in earthworm that are similar in structure classified into three types? Mention the names of each.

Solution:

Nephridia in earthworms are similar in structure they are classified into different types based on their location.

- Septal Nephridia: It is located in both sides of the intersegmental septa from the 15th segment till the end
- Pharyngeal Nephridia: It is located in the 4th, 5th and 6th segment of the earthworm.
- Integumentary Nephridia: It is located in the body wall i.e., the integument of the earthworm.

13. The common name of some animals are given in Column A, write their scientific name in Column B.

Column A	Column B
a. Tiger
b. Peacock
c. Housefly

Solution:

a. Tiger - *Panthera tigris*.

b. Peacock - *Pavocristatus*.

c. Housefly - *Musca domestica*.

14. Complete the following statement :

- In cockroach grinding of food particle is performed by _____
- Malpighian tubules help in removal of _____
- Hind gut of cockroach is differentiated into _____
- In cockroach blood vessels open into spaces called _____

Solution:

- In cockroach grinding of food particle is performed by gizzard.
- Malpighian tubules help in removal of Nitrogenous excretory products.
- The hindgut of cockroach is differentiated into ileum, colon and rectum.
- In cockroach blood vessels open into spaces called Haemocoel.

15. Mention special features of an eye in Cockroach.

Solution:

- They have compound eyes that contain numerous small visual units
- Ommatidia is known as the visual unit in their eye
- Their eyes have a lower resolution but higher sensitivity

16. Frog is a poikilotherm, exhibits camouflage and undergoes aestivation and hibernation, how are all these benefits to it?

Solution:

During hibernation and aestivation, it sleeps and uses the stored energy in the body and emerges after the harsh environmental temperature has passed. Camouflage helps in the frog's protection and catching prey.

17. Write the functions in brief in column B, appropriate to the structures given in column A.

Column A	Column B
a. Nictitating membrane	i.
b. Tympanum	ii.
c. Copulatory pad	iii.

Solution:

- Nictitating membrane - i. It is the third eyelid present in frogs which protects the frog from water and land environment
- Tympanum – ii. It is present behind the eyes of a frog. It helps in transmitting soundwaves to the inner part of the ear in frogs.
- Copulatory pad - iii. The male frogs have a copulatory pad on the forelimbs which help in holding the female tightly during mating.

18. Write the appropriate type of tissues in column B according to the functions mentioned in column A.

Column A	Column B
a. Secretion and absorption	i.
b. Protective covering	ii.
c. Linking and supporting framework	iii.

Solution:

- Secretion and absorption i. Cuboidal epithelium.
- Protective covering ii. Stratified epithelium.
- Linking and supporting framework iii. Connective tissue.

19. Using appropriate examples, differentiate between false and true body segmentation.

Solution:

- False or pseudo body segmentation is the segmentation of the ectoderm. For example: In tapeworms,

it shows external segmentation but it does not have internal segmentation.

2. True body segmentation is the series of repetition of a body part. It shows external segmentation as well as internal segmentation. For example, It is observed in arthropods like earthworms.

20. What is special about tissue present in the heart?

Solution:

Cardiac muscle tissue is an extremely specialized tissue which is only found in the heart. It has similar characteristics of skeletal as well as smooth muscles. It can sustain contraction and relaxation rapidly. They are involuntary.

LONG ANSWER TYPE QUESTIONS

1. Classify and describe epithelial tissue based on structural modifications of cells.

Solution:

Epithelial cells are divided into two broad categories based on structural modification of the cells:

(A) Simple Epithelium and (B) Compound (Stratified) Epithelium

Simple Epithelium: It is the epithelium tissue which has a single layer of the cell. It is further divided into three: Squamous cells, cuboidal cells and columnar epithelium.

Compound (stratified) Epithelium: It is the epithelium tissue which has two or more layers of cells lined together.

2. Write down the common features of the connective tissue. Based on structure and function, differentiate between bones and cartilages.

Solution:

Connective tissues have an important role in the binding and connection of different tissues and organs. They provide structural rigidity support and protection of the body.

They can regenerate

Fibres, cells and matrix are present in connective tissues.

Bones	Cartilage
They are firm and brittle	They are soft and elastic
Ossein is present in its matrix as protein	Aggregate is present in the matrix as protein
Bidirectional growth	Unidirectional growth
Own blood supply	Lacks blood supply

3. Comment upon the gametic exchange in earthworm during mating.

Solution:

Gamete exchange of earthworms occurs through cross-fertilization and external fertilization.

Two earthworms come closer to each other and they get ventrally attached in the opposite direction.

ii) The copulation process begins and the male genital pore (i.e., papilla) of one earthworm is inserted into the spermathecal pore of the other earthworm.

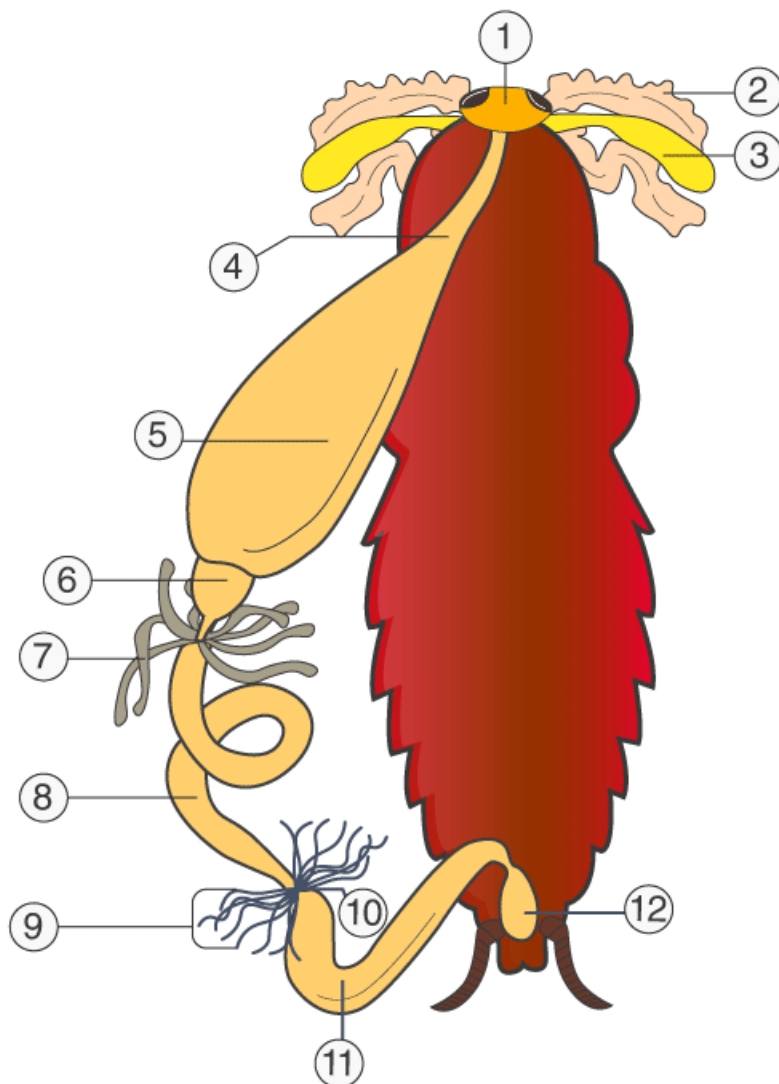
iii) The earthworm remains mutually close together by the penetration of setae in their bodies.

iv) Sperm and prostatic fluid of the earthworm are exchanged and the spermathecal pore stores the spermathecae.

v. The remains like than for an hour and the sperm and egg passed into cocoon which gets secreted by the clitellar gland present in the 14th to the 16th segment of the earthworm.

4. Explain the digestive system of Cockroach with the help of a labelled sketch.

Solution:



- | | | | |
|----------------------|-------------------|----------------------|--------------|
| 1 Pharynx | 2 Salivary glands | 3 Salivary reservoir | 4 Oesophagus |
| 5 Crop | 6 Gizzard | 7 Hepatic caecae | 8 Midgut |
| 9 Malpighian tubules | 10 Ileum | 11 Colon | 12 Rectum |

Their alimentary canal consists of three parts:

(A) Foregut

(B) Midgut

(C) Hindgut

(A) Foregut: The foregut consists of the mouth in cockroaches. The oesophagus is a narrow tube-like structure which leads to an organ known as a crop. The crop is used to store food materials. It consists of the tongue and hypopharynx

B) Midgut: Midgut is a narrow and short tube-like structure. It has an organ known as gizzard which grinds the food into simpler components.

(C) Hindgut: The hindgut is further divided into three major parts: Ileum, Colon, and Rectum.

Malpighian tubules help in the elimination of the nitrogenous wastes and convert them to uric acid.

The anus is the last part of the digestive system of the cockroach.

5. Draw a neat and well-labelled diagram of the male reproductive system of a frog.

Solution:

