

Epithelial tissue is a sheet of cells that covers the body surface or lines the body cavity. It occurs in the body as a **covering, as a lining epithelium and as glandular, epithelium.**

-The functions of epithelium includes **protection, absorption, filtration, excretion, secretion and sensory reception.**

-The **squamous epithelium** is made of a single thin layer of flattened cells with irregular boundaries. They are found in the kidney glomeruli, air sacs of lungs, lining of heart, blood vessels and lymphatic vessels and are involved in functions like forming a diffusion boundary and filtration.

-The **cuboidal epithelium** is made of a single layer of cube like cells. This tissue is commonly found in the kidney tubules, ducts and secretory portions of small glands and surface of the ovary. Its main functions are secretion and absorption.

-The **columnar epithelium** is composed of single layer of tall cells with round to oval nuclei at the base. It lines the digestive tract from the stomach to the rectum.

-**ciliated type** propels mucus by ciliary actions and it lines the small bronchioles, fallopian tubes and uterus.

-**Pseudo-stratified epithelial** cells are columnar, but unequal in size. Although the epithelium is single layered yet it appears to be multi-layered because the nuclei lie at different levels in different cells.

CHAPTER- 4 -ORGAN AND ORGAN SYSTEMS IN ANIMALS

EVALUATION

1. The clitellum is a distinct part in the body of earthworm *Lampito mauritii*, it is found in?

- a. Segments 13 – 14 **b. Segments 14 – 17** c. Segments 12 – 13 d. Segments 14 - 16

2. Sexually, earthworms are

- a. Sexes are separate **b.Hermaphroditic but not self fertilizing**
c. Hermaphroditic and self – fertilizing d. Parthenogenic

3. To sustain themselves, earthworms must guide their way through the soil using their powerful muscles. They gather nutrients by ingesting organic matter and soil, absorbing what they need into their bodies. True or False: The two ends of the earthworm can equally ingest soil.

b. False

4. The head region of Cockroach -----pairs of -----and ----shaped eyes occur.

a. One pair, sessile compound and kidney shaped

- b. Two pairs, stalked compound and round shaped
c. Many pairs, sessile simple and kidney shaped
d. Many pairs, stalked compound and kidney shaped
5. The location and numbers of malpighian tubules in *Periplaneta*.

a. At the junction of midgut and hindgut, about 150.

- b. At the junction of foregut and midgut, about 150.
c. Surrounding gizzard, eight.
d. At the junction of colon and rectum, eight.

6. The type of vision in Cockroach is

- a. Three dimensional b. Two dimensional **c. Mosaic** d. Cockroach do not have vision

7. How many abdominal segments are present in male and female Cockroaches?

- a. 10, 10** b. 9, 10 c. 8, 10 **d. 9, 9**

8. Which of the following have an open circulatory system?

- a. Frog b. Earthworm c. Pigeon **d. Cockroach**

9. Buccopharyngeal respiration in frog

- a. is increased when nostrils are closed** b. Stops when there is pulmonary respiration
c. is increased when it is catching fly **d. stops when mouth is opened.**

10. Kidney of frog is

- a. Archinephros b. Pronephros **c. Mesonephros** d. Metanephros

11. Presence of gills in the tadpole of frog indicates that

- a. fishes were amphibious in the past
- b. fishes evolved from frog-like ancestors
- c. frogs will have gills in future

d. frogs evolved from gilled ancestor

12. Choose the wrong statement among the following:

- a. In earthworm, a single male genital pore is present.
- b. Setae help in locomotion of earthworms.

c. Muscular layer in the body wall of earthworm is made up of only circular muscles.

d. Typhlosole is part of the intestine of earthworm.

13. Which of the following are the sense organs of Cockroach?

a. Antennae, compound eyes, maxillary palps, anal cerci

- b. Antennae, compound eye, maxillary palps
- c. Antennae, ommatidia, maxillary palps, sternum
- d. Antennae, eyes, maxillary palps, and tarsus of walking legs

14. What characteristics are used to identify the earthworms?

-Light brown in colour, with purplish tinge at the anterior end, number of compartments called **segments** or **metameres**, 14 to 17 segments thickening **clitellum**.

15. What are earthworm casts?

-The undigested particles along with earth are passed out through the anus of earthworm, as **worm castings** or **vermicasts**.

16. How do earthworms breathe?

- Respiration takes place in earthworm through the body wall.
- The outer surface of the skin is richly supplied with blood capillaries which aid in the diffusion of gases.

17. Why do you call cockroach a pest?

-Cockroach carry with them harmful germs of various bacterial diseases like cholera, diarrhoea, tuberculosis, and typhoid and hence are known as "**Vectors**".

18. Comment on the functions of alary muscles?

-The triangular muscles that are responsible for blood circulation in the cockroach are called **alary muscles** (13 pairs).

19. Name the visual units of the compound eyes of cockroach.

- Cockroach consists of a pair of compound eyes at the dorsal surface of the head.
- Each eye is formed of about 2000 simple eyes called the **ommatidia** (singular: *ommatidium*).

20. How does the male frog attracts the female for mating?

- The male frog has a pair of **vocal sacs** and a copulatory or **nuptial pad** on the ventral side of the first digit of each forelimb .
- Vocal sacs assist in amplifying the croaking sound of frog.

21. Write the types of respiration seen in frog.

- Frog respire on land and in the water by two different methods.
- In water, **skin** acts as aquatic respiratory organ (**cutaneous respiration**).
- In land Respiration by lungs is called **pulmonary respiration** & In **buccal respiration** .

22. Differentiate between peristomium and prostomium in earthworm.

- The mouth is found in the centre of the first segment of the body, called the **peristomium**.
- Overhanging the mouth is a small flap called the upper lip or **prostomium**.

23. Give the location of clitellum and spermathecal openings in *Lampito mauritii*.

- 14 to 17 segment with a glandular thickening of the skin called the **clitellum**.
- Spermathecal openings are three pairs of small ventrolateral apertures lying intersegmentally between the grooves of the segments 6/7, 7/8 and 8/9.

24. Differentiate between tergum and a sternum.

- The abdomen in both male and female consists of 10 segments. Each segment is covered by the dorsal tergum.
- The ventral sternum and between them a narrow membranous pleuron on each side.

25. Head of cockroach is called hypognathous. Why?

-The head of cockroach is small, triangular lies at right angle to the longitudinal body **axis**. the mouth parts are directed downwards so it is **hypognathous**.

26. How respiration takes place in cockroach?

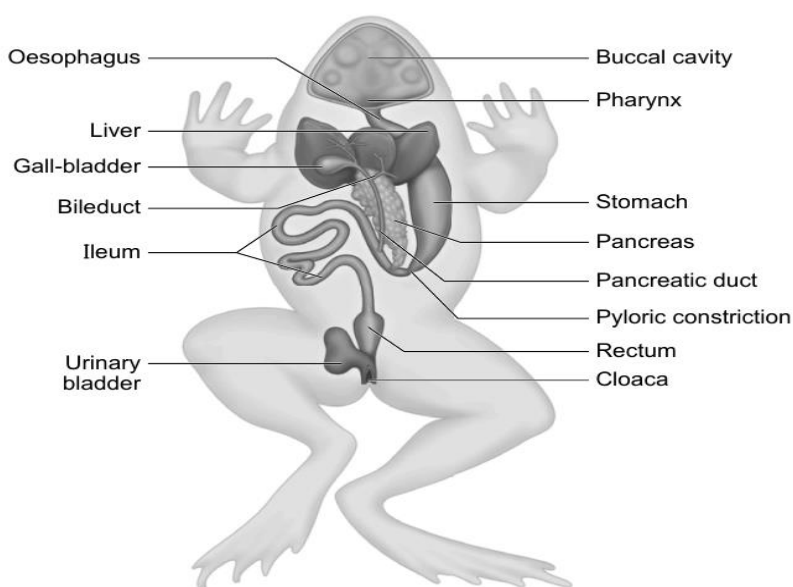
-The respiratory system of cockroach is well developed.

- Branched tubes known as **trachea** open through 10 pairs of small holes called **spiracles** or **stigmata**, present on the lateral side of the body.

27. What are the components of blood in frog?

-The **blood** consists of **plasma** [60%] and blood **cells** [40 %], red blood cells, white blood cells, and platelets.

28. Draw a neat labeled diagram of the digestives system of frog.



29. Explain the reproductive system of frog

-**The male frog** has a pair of testes which are attached to the kidney and the dorsal body wall by folds of peritonium called mesorchium.

-Vasa efferentia arise from each **testis**. They enter the kidneys on both side and open into the bladder canal. Finally, it communicates with the urinogenital duct that comes out of kidneys and opens into the cloaca.

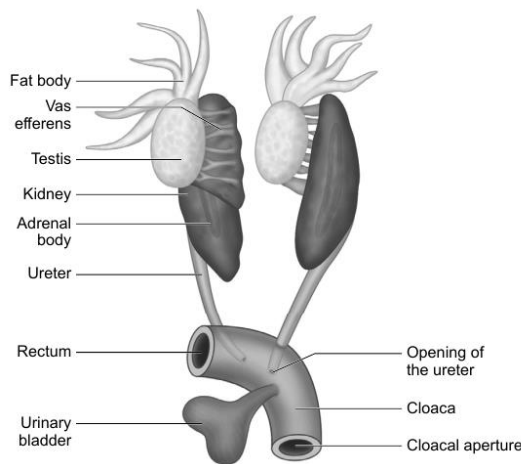


Figure 4.23 *Rana hexadactyla* - Male
Urinogenital System

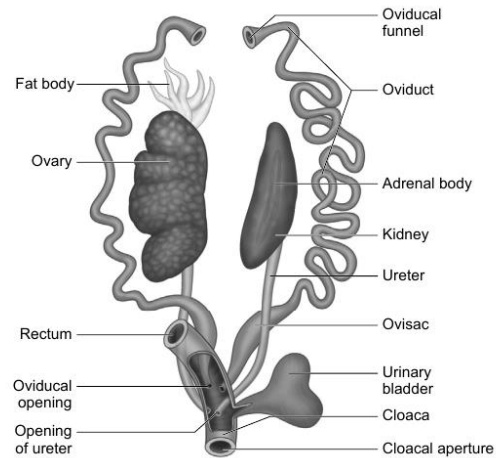


Figure 4.24 *Rana hexadactyla* - Female
Urinogenital System

-Female reproductive system consists of paired **ovaries**, attached to the kidneys, and dorsal body wall by folds of peritoneum called mesovarium.

-There is a pair of coiled **oviducts** lying on the sides of the kidney. Each oviduct opens into the body cavity at the anterior end by a funnel like opening called ostia.

-Unlike the male frog, the female frog has separate genital ducts distinct from ureters. Posteriorly the oviducts dilated to form **ovisacs** before they open into cloaca.

-Ovisacs store the eggs temporarily before they are sent out through the cloaca. Fertilization is external.

CHAPTER ; 5 DIGESTION AND ABSORPTION

Evaluation

1. Choose the incorrect sentence from the following:

- Bile juice emulsifies the fat.
- Chyme is a digestive acidic food in stomach.
- Pancreatic juice converts lipid into fatty acid and glycerol.
- d. Enterokinase stimulates the secretion of pancreatic juice.**

2. What is chyme....?-

- The process of conversion of fat into small droplets.
- The process of conversion of micelles substances of glycerol into fatty droplet.
- c. The process of preparation of incompletely digested acidic food through gastric juice.**
- The process of preparation of completely digested liquid food in midgut.

3. Which of the following hormones stimulate the production of pancreatic juice and bicarbonate?

- Angiotensin and epinephrine
- Gastrin and insulin
- c. Cholecysokinin and secretin**
- Insulin and glucagon

4. The sphincter of Oddi guards

- a. Hepatopancreatic duct**
- Common bile duct
- Pancreatic duct
- Cystic duct

5. In small intestine, active absorption occurs in case of

- Glucose
- Amino acids
- Na⁺
- d. All the above**

6. Which one is incorrectly matched?