Chapter 7: Structural Organisation in Animals

Exercises — Exercises

Q1 Draw a neat diagram of digestive system of frog.

SOLUTION

The digestive system of frog consists of the alimentary canal and digestive glands.

Alimentary canal (mouth to cloaca):
Mouth → Buccal cavity → Pharynx → Oesophagus → Stomach → Small intestine (duodenum + intestine) → Rectum → Cloaca → Cloacal aperture

Digestive glands: Liver (with gall bladder) and Pancreas. Both open into the duodenum via a common bile duct.

Labelled diagram — key structures and their positions:
- Heart: upper body cavity (dorsal, not digestive but landmark in the diagram)
- Oesophagus: short tube from pharynx to stomach, runs along the right side
- Liver: large bilobed organ on the right
- Gall bladder: small sac attached to the liver, stores bile
- Lung: sac-like, to the left
- Stomach: J-shaped organ receiving oesophagus, on the left
- Fat bodies: yellowish finger-like projections near kidney
- Kidney: compact, dark red, bean-shaped, posterior
- Ureter: duct from kidney to cloaca
- Urinary bladder: thin-walled sac ventral to rectum
- Intestine: coiled tube after stomach
- Rectum: straight terminal part of intestine
- Cloaca: common chamber receiving rectum, ureters and reproductive ducts
- Cloacal aperture: external opening

Description of the diagram (as in Figure 7.2 of the textbook):
Draw the frog body outline. Place the three-chambered heart at the top centre. The oesophagus descends from the pharynx to the stomach on the left. The liver is a large bilobed structure on the upper right with the gall bladder tucked beneath it. The stomach lies to the left and continues as the coiled intestine that fills the lower abdominal region. The intestine leads to the rectum which opens into the cloaca at the posterior end. The cloaca opens to the exterior via the cloacal

aperture. The lungs appear as elongated pink sacs flanking the heart. The kidneys are compact and reddish, placed posteriorly on either side of the vertebral column. The ureter runs from each kidney to the cloaca. The urinary bladder is a thin-walled sac ventral to the rectum, opening into the cloaca.

Answer: The digestive system of frog includes: Mouth → Buccal cavity → Pharynx → Oesophagus → Stomach → Intestine (duodenum) → Rectum → Cloaca → Cloacal aperture. Digestive glands: Liver (+ Gall bladder) and Pancreas, both opening into the duodenum. Key labels: Heart, Oesophagus, Liver, Gall bladder, Lung, Stomach, Fat bodies, Kidney, Ureter, Urinary bladder, Intestine, Rectum, Cloaca, Cloacal aperture.

Q2 Mention the function of the Ureters in frog.

SOLUTION

In frogs, the ureters serve a dual function depending on the sex of the individual.

In male frogs:
The ureters function as urinogenital ducts. They carry both urine from the kidneys and sperms from the testes (via vasa efferentia and Bidder's canal) to the cloaca. Thus, in males, the ureter serves as a common passage for both excretory and reproductive products.

In female frogs:
The ureters carry only urine from the kidneys to the cloaca. The oviducts open separately into the cloaca and are not connected with the ureters.

In both sexes, the ureters ultimately open into the cloaca, from where the excretory (and in males, reproductive) products are eliminated to the exterior through the cloacal aperture.

Answer: In male frogs, ureters act as urinogenital ducts carrying both urine and sperms to the cloaca. In female frogs, ureters carry only urine from the kidneys to the cloaca (oviducts open separately into the cloaca).