



CLASS: XI	DEPARTMENT OF SCIENCE:2026 – 2027 SUBJECT: BIOLOGY	DATE: 13/10/2026
WORKSHEET NO. 10	UNIT-2 STRUCTURAL ORGANISATION IN PLANTS AND ANIMALS CH-7 STRUCTURAL ORGANISATION IN ANIMALS	NOTE: A4 FILE FORMAT
CLASS & SEC:	NAME OF THE STUDENT:	ROLL NO.

I. MULTIPLE CHOICE QUESTIONS:

- Which of the following features is a characteristic of sexual dimorphism found only in male frogs?
 - A nictitating membrane covering the eyes.
 - Presence of vocal sacs and copulatory pads.
 - A tympanum located on either side of the eyes.
 - Webbed digits on the hind limbs.
- Why is the alimentary canal of a frog relatively short compared to other vertebrates?
 - The stomach performs the majority of nutrient absorption.
 - Frogs are herbivores and digest food rapidly.
 - The cloaca replaces the function of the large intestine.
 - Frogs are carnivores, which reduces the required length of the intestine.
- How does a frog primarily maintain its skin in a moist condition?
 - By staying exclusively in deep burrows during the day.
 - By absorbing atmospheric humidity through the nictitating membrane.
 - By drinking large quantities of water through the mouth.
 - Through the secretion of mucus from glands in the skin.
- Which structure is responsible for capturing prey in *Rana tigrina*?
 - The pharynx and oesophagus suction.
 - The teeth located in the buccal cavity.
 - The bilobed tongue.
 - The muscular forelimbs with four digits.
- During pulmonary respiration, air enters the lungs through which sequence of structures?
 - Nostrils → Buccal cavity → Lungs
 - Cloaca → Rectum → Lungs
 - Tympanum → Pharynx → Lungs
 - Skin → Blood → Lungs

II. ASSERTION & REASONING QUESTIONS:

For the following questions, two statements are given, one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (i), (ii), (iii) and (iv) as given below:

- Both A and R are true, and R is the correct explanation of the assertion.
- Both A and R are true, but R is not the correct explanation of the assertion.
- A is true, but R is false.

D. A is false, but R is true

6. Assertion (A): Frogs disappear during the peak of summer and winter.
Reason (R): Frogs are poikilotherms and take shelter in deep burrows to protect themselves from extreme temperatures.
7. Assertion (A): The skin of the frog acts as a respiratory organ during hibernation.
Reason (R): Pulmonary respiration is the only method of gaseous exchange available to the frog on land
8. Assertion (A): Frogs possess a hepatic portal system.
Reason (R): A special venous connection exists between the liver and the intestine in frogs.
9. Assertion (A): The renal portal system connects the kidneys to the lower parts of the body.
Reason (R): This system allows blood from the hind limbs to pass through the kidneys before returning to the heart.
10. Assertion (A): Frogs are considered ureotelic animals.
Reason (R): The primary nitrogenous waste excreted by frogs is uric acid.

III. VERY SHORT ANSWER QUESTIONS (2M):

11. Describe the function and location of the nictitating membrane.
12. What is the tympanum, and what role does it play in the frog's sensory system?
13. Explain the structural adaptation of the frog's tongue for capturing prey.
14. How do the digits of the forelimbs differ from those of the hind limbs in terms of number and structure?

IV. SHORT ANSWER TYPE QUESTIONS (3M):

15. (a) How is it possible to identify a male frog from a female frog?
(b) State the type of circulation in a frog and also the number of chambers in the heart of the frog.
16. Compare and contrast cutaneous respiration and pulmonary respiration in frogs. Under what conditions is each used?
17. Explain the role of the liver and pancreas in the digestive system. What specific substances do they secrete, and what are their functions?

V. SOURCE-BASED/ CASE STUDY-BASED QUESTIONS

18. As soon as the rainy season starts, the frog comes out from aestivation. It starts breeding immediately and continues from July to September. Males gather in shallow waters and attract females by croaking, which is often a sex call. The male mounts upon the back of the female and grasps firmly around her thorax with his forelegs. The males have nuptial pads on the bases of inner fingers which are fully developed during the breeding season. It helps them in holding the slippery female. Amplexus is the term given for this sexual embrace. Amplexus continues for several days till the female deposits several hundred ova or eggs through her cloaca into water. Milt or seminal fluid is discharged by males over eggs. Milt or seminal fluid contains spermatozoa that fertilise eggs.
 - A. What is the role of the nuptial pads in male frogs?
 - B. What is the term used to describe the sexual embrace between male and female frogs?
 - C. How does fertilisation occur in frogs during the breeding season?

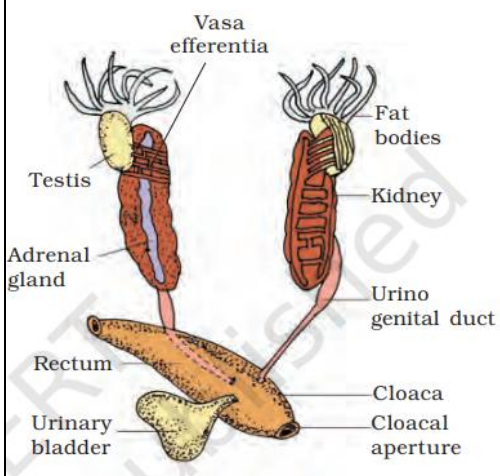
OR

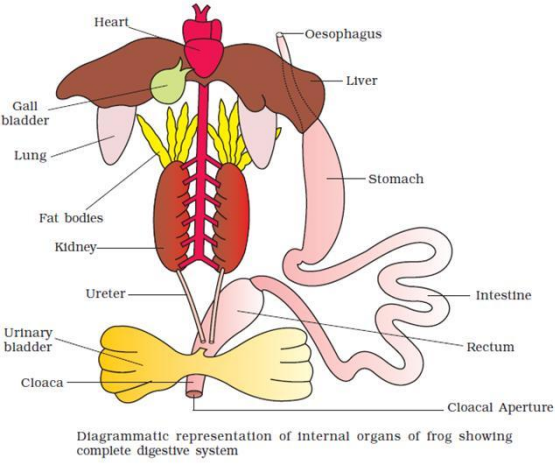
 - D. What is the function of the seminal fluid or milt in frog reproduction?

VI. LONG ANSWER TYPE QUESTIONS (5M):

19. Draw a neat labelled diagram of the male reproductive system of a frog.
20. Answer the following questions with relation to the digestive system of frogs.
 - a. How do frogs catch their prey?
 - b. Where is bile stored in the body of a frog?
 - c. Explain the digestion of food in a frog.
21. Draw a neat labelled diagram of the alimentary canal.
22. i) State the types of nervous coordination found in frogs.
ii) How does chemical coordination take place in frogs?
23. Discuss the circulatory system of the frog. Explain the difference between the arterial and venous systems, the composition of frog blood (including RBC characteristics), and the function of the lymphatic system.
24. Describe the structure and function of the frog's excretory system. Discuss the anatomy of the kidneys (nephrons), the path of urea, and the role of the urinary bladder.

	ANSWER KEY
I.	OBJECTIVE TYPE QUESTIONS:
1.	B. Presence of vocal sacs and copulatory pads.
2.	D. Frogs are carnivores, which reduces the required length of the intestine.
3.	D. Through the secretion of mucus from glands in the skin.
4.	C. The bilobed tongue.
5.	A. Nostrils → Buccal cavity → Lungs.
II	Assertion and Reason
6.	A. Both A and R are true, and R is the correct explanation of the assertion.
7.	C. A is true, but R is false
8.	A. Both A and R are true, and R is the correct explanation of the assertion.
9.	A. Both A and R are true, and R is the correct explanation of the assertion.
10.	C. A is true, but R is false
III.	VERY SHORT QUESTIONS (2M):
11.	The nictitating membrane is a transparent membrane present in the frog's eyes. It protects the eyes, particularly when the frog is underwater, and helps it see while submerged.
12.	The tympanum is a circular membrane present on either side of the frog's head, behind the eyes. It acts as an eardrum and helps the frog detect sound vibrations.
13.	The frog has a long, sticky, bilobed tongue attached at the anterior end of the lower jaw, with its free end directed backwards. It can be rapidly protruded to capture insects and other small prey.
14.	The forelimbs have four digits, whereas the hind limbs have five digits. The hind limbs are longer and stronger than the forelimbs, and the webbed toes help the frog swim.
IV	SHORT ANSWER TYPE QUESTIONS: (3M)
15.	(a) 1. Male frogs possess vocal sacs, whereas females lack vocal sacs. 2. Male frogs possess copulatory or nuptial pads on the first digit of the forelimbs, particularly during the breeding season. 3. Females generally have a broader abdomen, especially when carrying eggs.

	(b) Frogs have a closed circulatory system with incomplete double circulation. The heart is three-chambered, consisting of two atria and one ventricle. Some mixing of oxygenated and deoxygenated blood occurs in the ventricle.								
16.	Frogs also exchange gases through the buccal cavity. Cutaneous respiration is especially important during hibernation. <table border="1"> <thead> <tr> <th>Cutaneous respiration</th><th>Pulmonary respiration</th></tr> </thead> <tbody> <tr> <td>Occurs through the moist skin.</td><td>Occurs through the lungs.</td></tr> <tr> <td>Gases diffuse through the skin between the environment and blood.</td><td>Gases are exchanged between air in the lungs and blood.</td></tr> <tr> <td>Particularly important during hibernation and underwater.</td><td>Important when the frog is active on land.</td></tr> </tbody> </table>	Cutaneous respiration	Pulmonary respiration	Occurs through the moist skin.	Occurs through the lungs.	Gases diffuse through the skin between the environment and blood.	Gases are exchanged between air in the lungs and blood.	Particularly important during hibernation and underwater.	Important when the frog is active on land.
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17.	Liver: Secretes bile, which is stored in the gall bladder. Bile helps emulsify fats. Pancreas: Secretes pancreatic juice containing enzymes that digest proteins, carbohydrates and fats. Function: These secretions enter the small intestine and assist in the digestion of food.								
V	Source-Based / Case Study Questions								
18.	a) Nuptial pads are present on the first digit of the forelimbs of male frogs. They help the male hold the slippery female firmly during mating. b) The sexual embrace between male and female frogs during breeding is called amplexus. c) Fertilisation in frogs is external. The female releases eggs into the water through her cloaca, and the male releases seminal fluid containing sperm over the eggs. The sperm fertilise the eggs in the water. OR d) Milt is the seminal fluid released by the male frog. It contains spermatozoa, which fertilise the eggs released by the female in water, resulting in external fertilisation.								
VI	Long Answer Questions								
19.	 The male reproductive system consists of a pair of testes attached to the kidneys by a mesorchium. The testes produce sperm. Ten to twelve vasa efferentia arise from each testis and enter the kidneys. The sperm pass into the urinogenital ducts, which open into the cloaca. The fat bodies store reserve food.								

20.	a) Frogs are carnivorous and feed on insects and other small animals. They capture prey with their long, sticky, bilobed tongue, which is attached at the anterior end of the lower jaw. The tongue is rapidly protruded to catch prey. The teeth help hold the prey, which is swallowed without chewing. b) Bile is secreted by the liver and stored in the gall bladder. It is released into the small intestine, where it helps emulsify fats. c) Buccal cavity: Food is captured by the sticky tongue and swallowed. Stomach: Gastric juice containing hydrochloric acid and digestive enzymes helps digest proteins. Small intestine: Bile helps emulsify fats. Pancreatic and intestinal enzymes complete the digestion of proteins, carbohydrates and fats. Absorption: Digested nutrients are absorbed through the intestinal wall. Egestion: Undigested matter passes through the rectum and is expelled through the cloaca.
21.	 Labels to include: • Mouth • Buccal cavity • Pharynx • Oesophagus • Stomach • Small intestine • Large intestine or rectum • Cloaca • Liver • Gall bladder • Pancreas The alimentary canal consists of the mouth, buccal cavity, pharynx, oesophagus, stomach, intestine, rectum and cloaca. The liver and pancreas are digestive glands. The liver secretes bile, and the pancreas secretes pancreatic juice.
22.	i) The nervous system of a frog consists of three main parts: 1. Central nervous system: Brain and spinal cord. 2. Peripheral nervous system: Cranial and spinal nerves. 3. Autonomic nervous system: Regulates involuntary activities of internal organs. ii) Chemical coordination takes place through hormones secreted by endocrine glands. These hormones are transported by blood to target organs and regulate their activities. The endocrine glands of frogs include the pituitary, thyroid, parathyroid, thymus, pineal body, pancreatic

	islets, adrenal glands and gonads.
23.	The frog has a closed circulatory system consisting of the heart, blood vessels and blood. 1. Heart: The heart has three chambers: two atria and one ventricle. The right atrium receives deoxygenated blood, while the left atrium receives oxygenated blood. Both atria empty into the ventricle. Frogs have incomplete double circulation. 2. Arterial system: Arteries carry blood away from the heart. The main arterial arches distribute blood to the head, body, lungs and skin. 3. Venous system: Veins return blood to the heart. Major veins include the venae cavae and pulmonary veins. Frogs also possess hepatic and renal portal systems. 4. Composition of blood: Blood consists of plasma and formed elements: red blood cells (RBCs), white blood cells (WBCs) and thrombocytes. Frog RBCs are oval, nucleated cells containing haemoglobin. RBCs transport oxygen, WBCs help defend the body against infection, and thrombocytes help in blood clotting. 5. Lymphatic system: The lymphatic system consists of lymph, lymph vessels and lymph sacs. It returns excess tissue fluid to the blood and helps maintain fluid balance.
24.	The excretory system of a frog consists of a pair of kidneys, a pair of ureters, a urinary bladder and a cloaca. 1. Kidneys: The frog has a pair of elongated, reddish-brown kidneys located in the posterior region of the body cavity along the vertebral column. They filter blood and remove nitrogenous wastes. 2. Nephrons: Nephrons are the structural and functional units of the kidneys. Each nephron consists of a renal corpuscle, containing Bowman's capsule and a glomerulus, and a renal tubule. Filtration occurs in the glomerulus, while selective reabsorption and secretion occur along the tubule. 3. Path of urea: Urea is produced in the liver and transported by blood to the kidneys. It is filtered from the blood and excreted in urine. Urine passes through the ureters into the cloaca. In male frogs, the ureters also carry sperm and are therefore called urinogenital ducts. 4. Urinary bladder: The urinary bladder is a thin-walled sac that opens into the cloaca. It temporarily stores urine before it is expelled from the body. 5. Function: The excretory system removes metabolic wastes and helps maintain water and salt balance. Adult frogs are ureotelic, meaning that urea is their principal nitrogenous waste.

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