YAKEEN NEET 2.0

2026

12.06.2025

STRUCTURAL ORGANISATION IN ANIMALS

ZOOLOGY | Lecture – 11

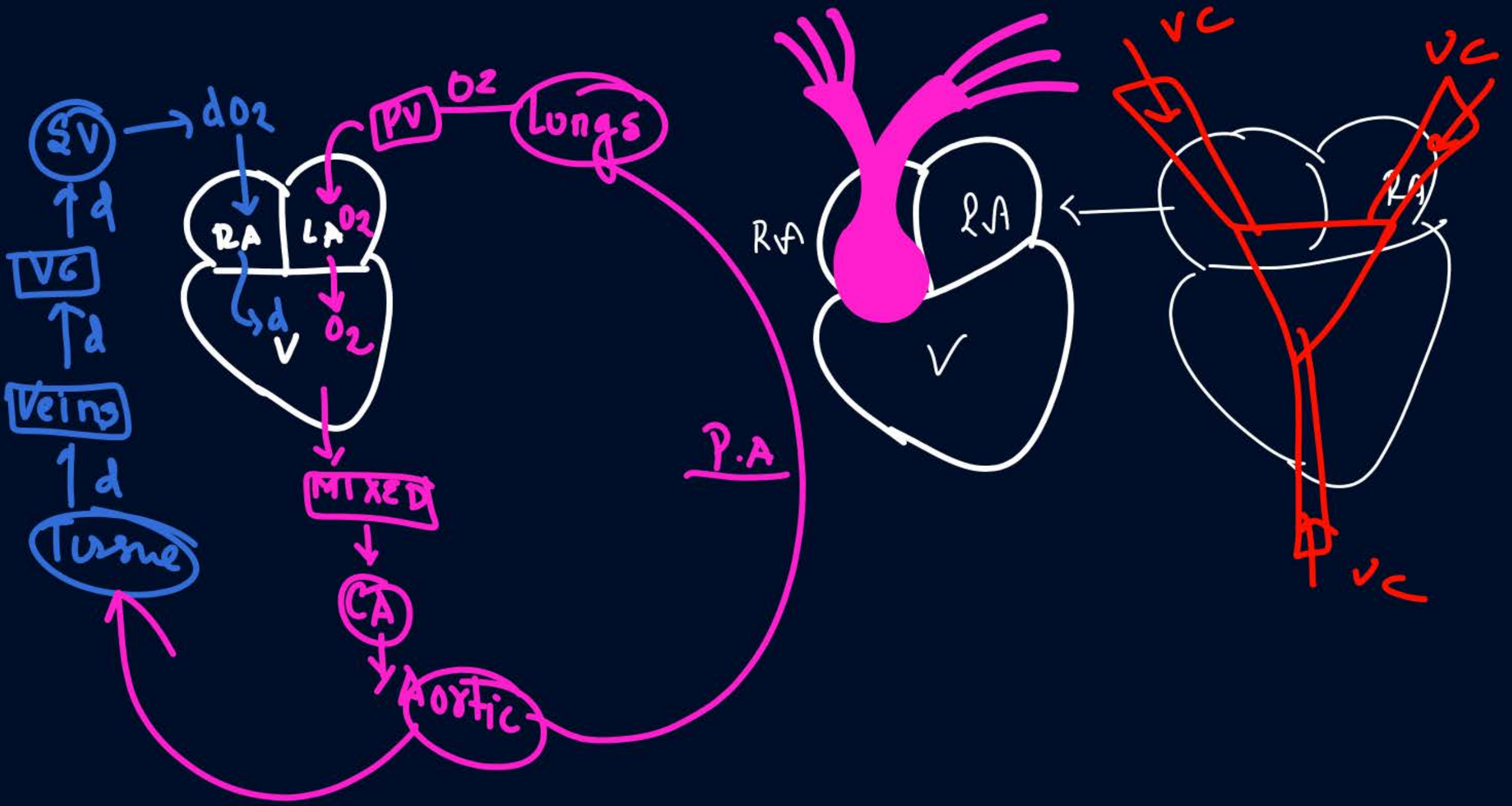
By- SAMAPTI MAM

Topics to be covered

1. FROG Part-04
2.
3.
4.

MY TELEGRAM

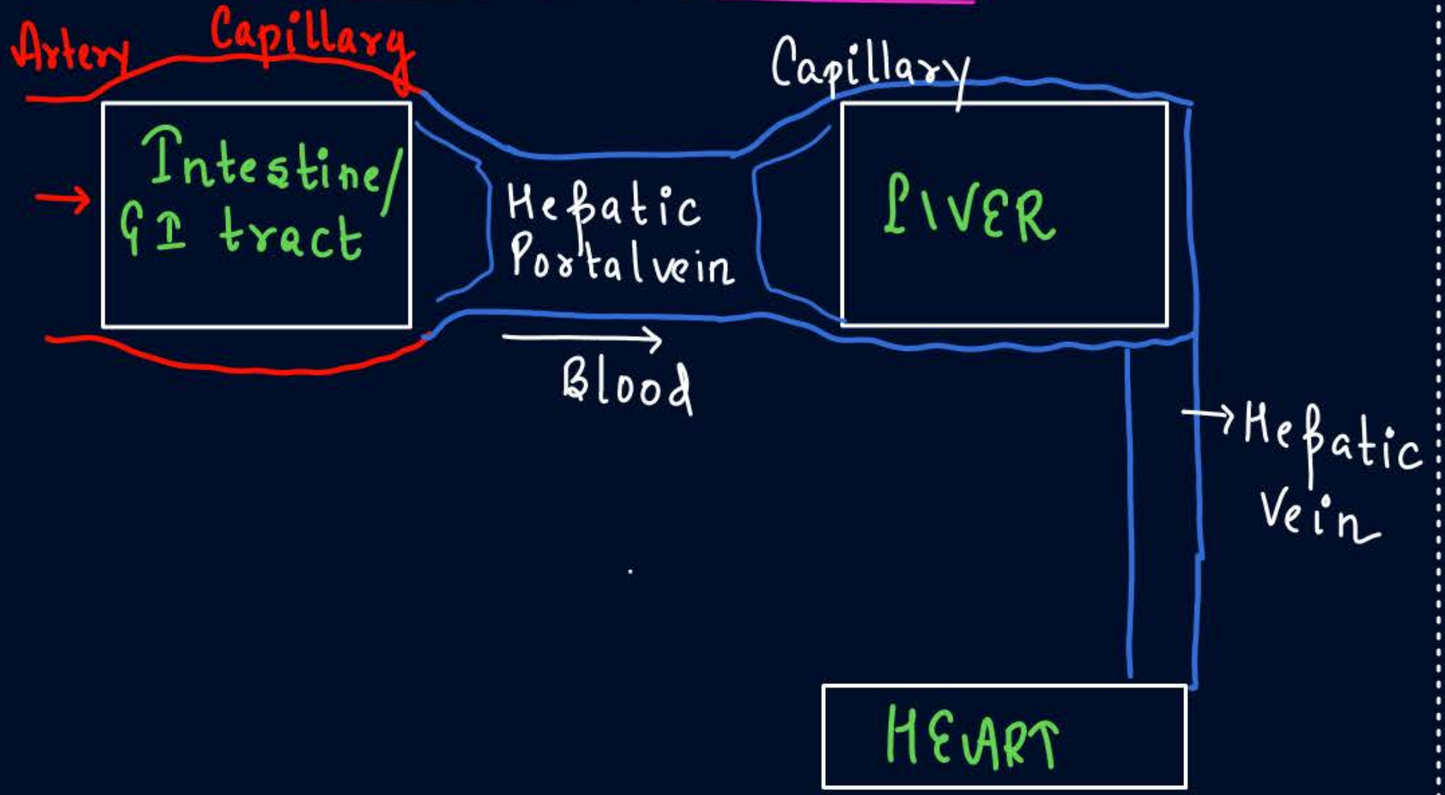
#2 anaphiexpress



3) **Portal Circulation**: Special venous (veins) connections b/w 2 organs, starts with a capillary & ends with capillary.

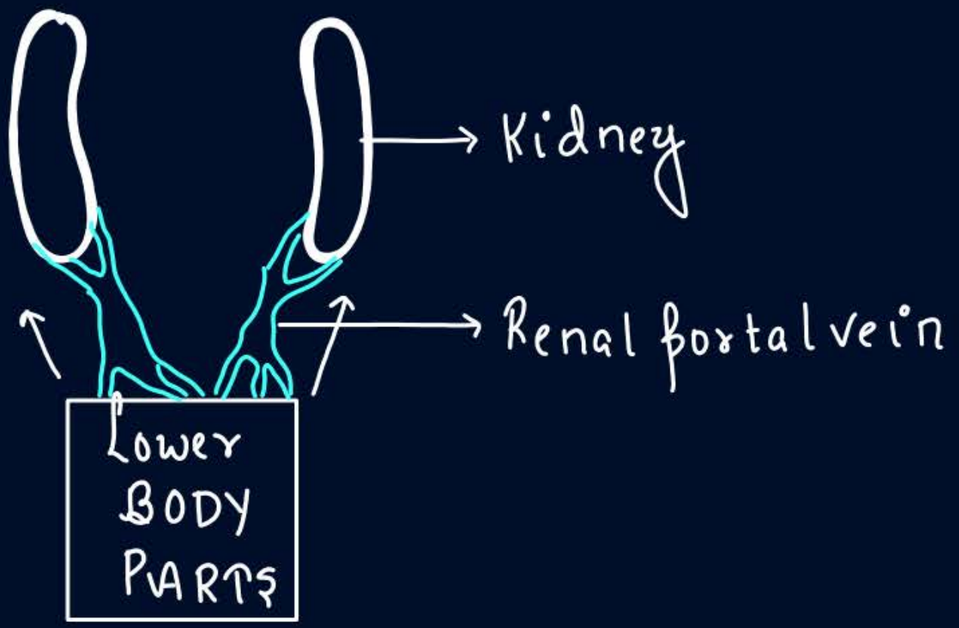
Naming of Portal system: On the basis of Organ-2

∴ ① HEPATIC PORTAL SYSTEM:



→ Connection b/w Intestine & liver.

③ Renal Portal system: Connection b/w Lower Body parts & Kidney

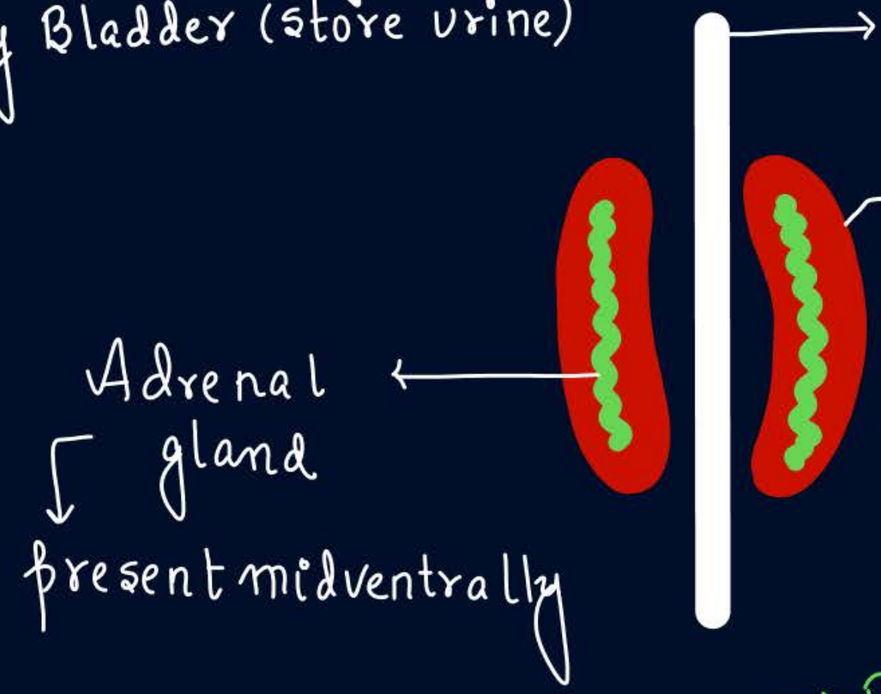


The vascular system of frog is well-developed closed type. Frogs have a lymphatic system also. The blood vascular system involves heart, blood vessels and blood. The lymphatic system consists of lymph, lymph channels and lymph nodes. Heart is a muscular structure situated in the upper part of the body cavity. It has three chambers, two atria and one ventricle and is covered by a membrane called pericardium. A triangular structure called sinus venosus joins the right atrium. It receives blood through the major veins called vena cava. The ventricle opens into a sac-like conus arteriosus on the ventral side of the heart. The blood from the heart is carried to all parts of the body by the arteries (arterial system). The veins collect blood from different parts of body to the heart and form the venous system. Special venous connection between liver and intestine as well as the kidney and lower parts of the body are present in frogs. The former is called hepatic portal system and the latter is called renal portal system. The blood is composed of plasma and cells. The blood cells are RBC (red blood cells) or erythrocytes, WBC (white blood cells) or leucocytes and platelets. RBC's are nucleated and contain red coloured pigment namely haemoglobin. The lymph is different from blood. It lacks few proteins and RBCs. The blood carries nutrients, gases and water to the respective sites during the circulation. The circulation of blood is achieved by the pumping action of the muscular heart.

Hepatic Portal
La Liver NH3 → Urea

Excretory system: Well developed having:

1. A pair of KIDNEY
2. A pair of Ureter (Carry urine)
3. A urinary Bladder (store urine)
4. A cloaca



- Nephrons/uriniferous tubules
  - Structural & functional unit of Kidney

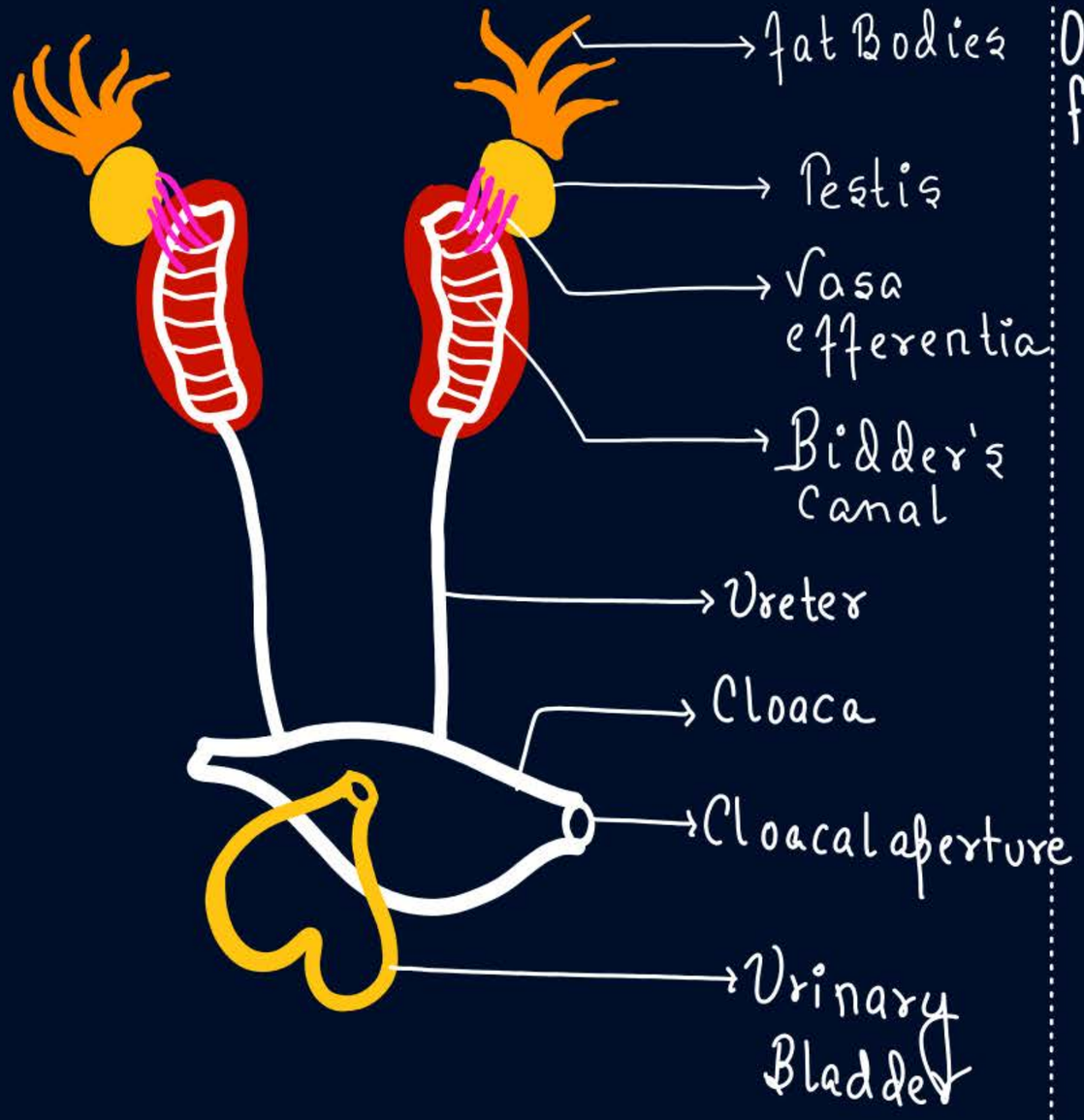
- Excretory Product: UREA (Ureotelic animals) → Frog

Note: Tadpole Larva: NH_3 (Ammonotelic)

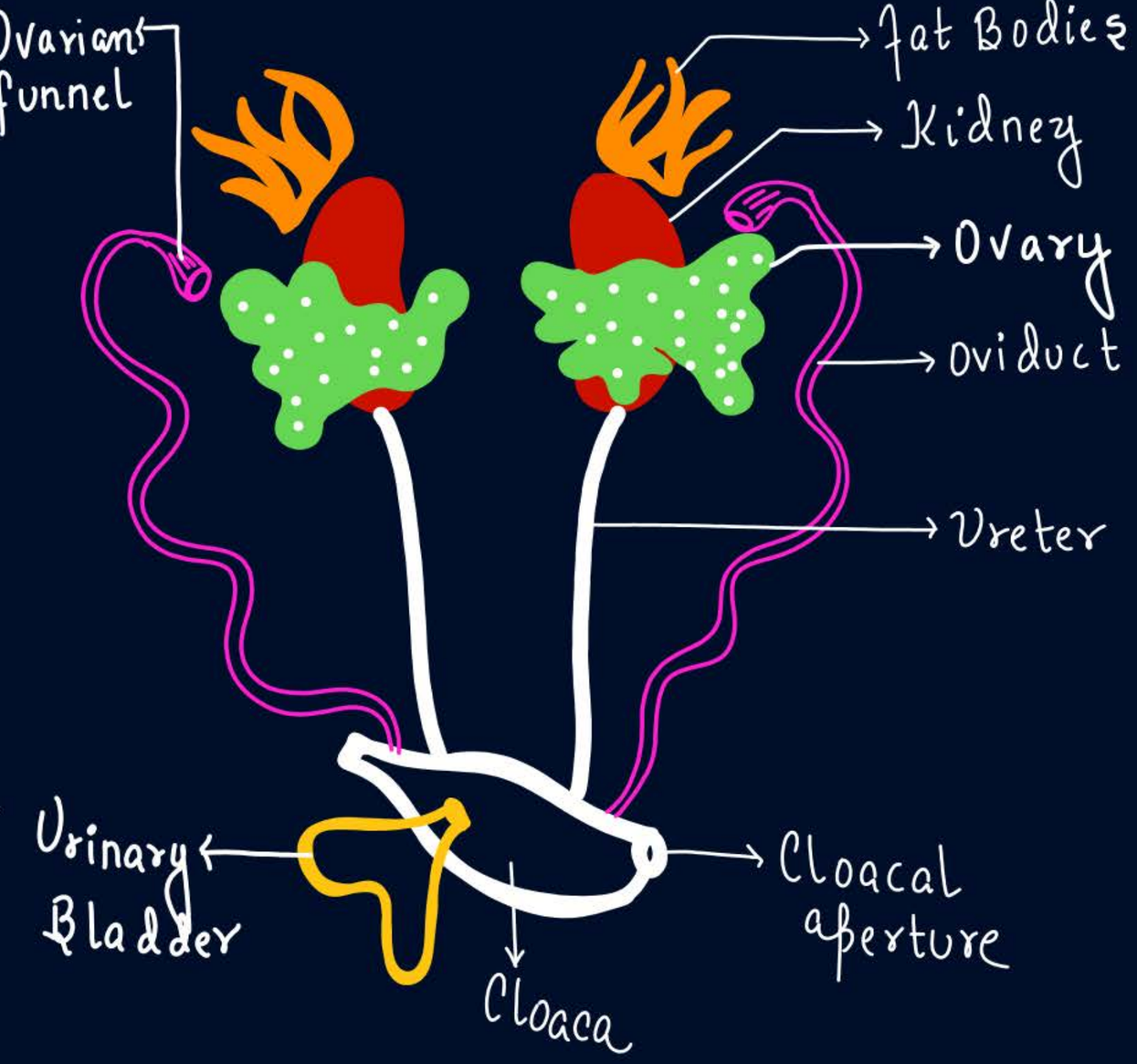
Reproductive system

The elimination of nitrogenous wastes is carried out by a well developed excretory system. The excretory system consists of a pair of kidneys, ureters, cloaca and urinary bladder. These are compact, dark red and bean like structures situated a little posteriorly in the body cavity on both sides of vertebral column. Each kidney is composed of several structural and functional units called uriniferous tubules or nephrons. Two ureters emerge from the kidneys in the male frogs. The ureters act as urinogenital duct which opens into the cloaca. In females the ureters and

♂ R.S.


Fat Bodies
Testis
Vasa efferentia
Bidder's Canal
Ureter
Cloaca
Cloacal aperture
Urinary Bladder

♀ R.S


Ovarian funnel
Fat Bodies
Kidney
Ovary
Oviduct
Ureter
Urinary Bladder
Cloaca
Cloacal aperture

♂ R.S

1) **TESTIS**: 1 pair, yellowish, ovoid attached anteriorly to Kidney with the help of double membranous peritoneum (internal lining Body cavity): K/a MESORCHIUM
   - Sperm forms.
2) **VASA EFFERENTIA**: 10-12 Vasa-effe-rentia from each testis carries sperm into the Bidder's canal inside KIDNEY.
   → There is a functional connection b/w Testis & Kidney.
3) Ureter (Urinogenital duct): In ♂ Ureter can carry both Urine as well as sperm.

Testis → (Sperm) → Vasa efferent → Bidder → Ureter → Cloaca → Cloacal APERTURE.

♀ R.S

1) **OVARIES**: 1 pair
   - Ova is produced
   * NO FUNCTIONAL CONNECTION b/w Ovary & Kidney
2) **Oviduct**: 1 pair of Oviduct collects egg from Ovary

↓

Opens seperately into Cloaca

↓

Cloaca, Cloacal aperture, outside.

Fertilisation & Development:

External fertilisation: Fertilisation outside the Body (In Water)

↳ '2500-3000' ova are laid at once & ova fuses with sperm to form ZYGOTE.

Indirect development: Development through Larval stage

↳ 'TADPOLE LARVA' that has no limbs & a tail undergoes metamorphosis (change in morphology) to convert into ADULT frog. (Tail dissappear, limbs present)

oviduct open seperately in the cloaca. The thin-walled urinary bladder is present ventral to the rectum which also opens in the cloaca. The frog excretes urea and thus is a **ureotelic** animal. Excretory wastes are carried by blood into the kidney where it is separated and excreted.

The system for control and coordination is highly evolved in the frog. It includes both neural system and endocrine glands. The chemical coordination of various organs of the body is achieved by hormones which are secreted by the endocrine glands. The prominent endocrine glands found in frog are pituitary, thyroid, parathyroid, thymus, pineal body, pancreatic islets, adrenals and gonads. The nervous system is organised into a central nervous system (brain and spinal cord), a peripheral nervous system (cranial and spinal nerves) and an autonomic nervous system (sympathetic and parasympathetic). There are ten pairs of cranial nerves arising from the brain. Brain is enclosed in a bony structure called brain box (cranium). The brain is divided into fore-brain, mid-brain and hind-brain. Forebrain includes olfactory lobes, paired cerebral hemispheres and unpaired diencephalon. The midbrain is characterised by a pair of optic lobes. Hind-brain consists of cerebellum and medulla oblongata. The medulla oblongata passes out through the foramen magnum and continues into spinal cord, which is enclosed in the vertebral column.

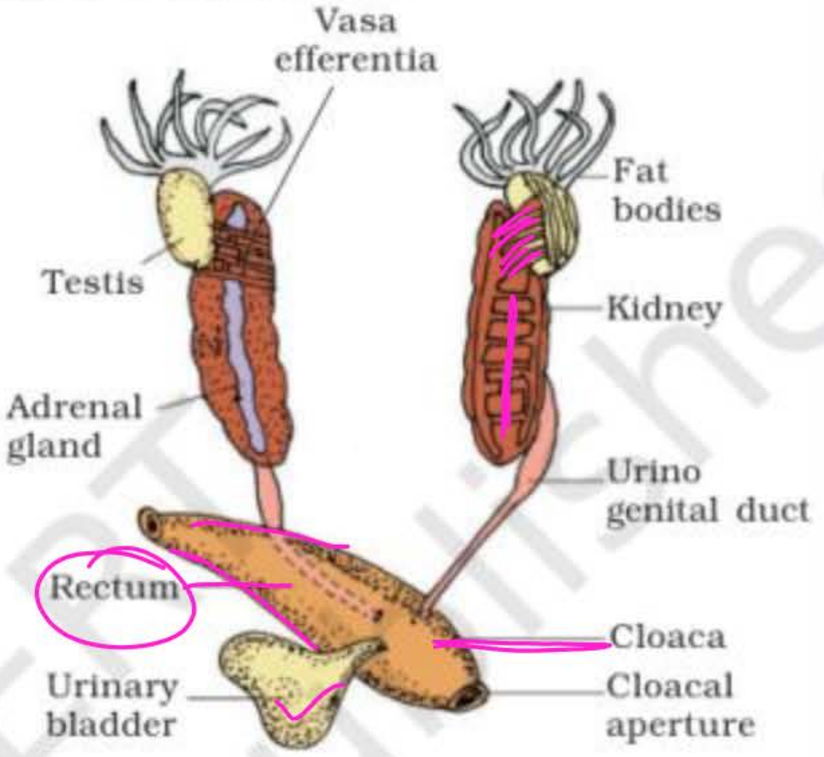


Figure 7.3 Male reproductive system

magnum and continues into spinal cord, which is enclosed in the vertebral column.

Frog has different types of sense organs, namely organs of touch (sensory papillae), taste (taste buds), smell (nasal epithelium), vision (eyes) and hearing (tympanum with internal ears). Out of these, eyes and internal ears are well-organised structures and the rest are cellular aggregations around nerve endings. Eyes in a frog are a pair of spherical structures situated in the orbit in skull. These are simple eyes (possessing only one unit). External ear is absent in frogs and only tympanum can be seen externally. The ear is an organ of hearing as well as balancing (equilibrium).

Frogs have well organised male and female reproductive systems. Male reproductive organs consist of a pair of yellowish ovoid testes (Figure 7.3), which are found adhered to the upper part of kidneys by a double fold of peritoneum called mesorchium. Vasa efferentia are 10-12 in number that arise from testes. They enter the kidneys on their side and open into Bidder's

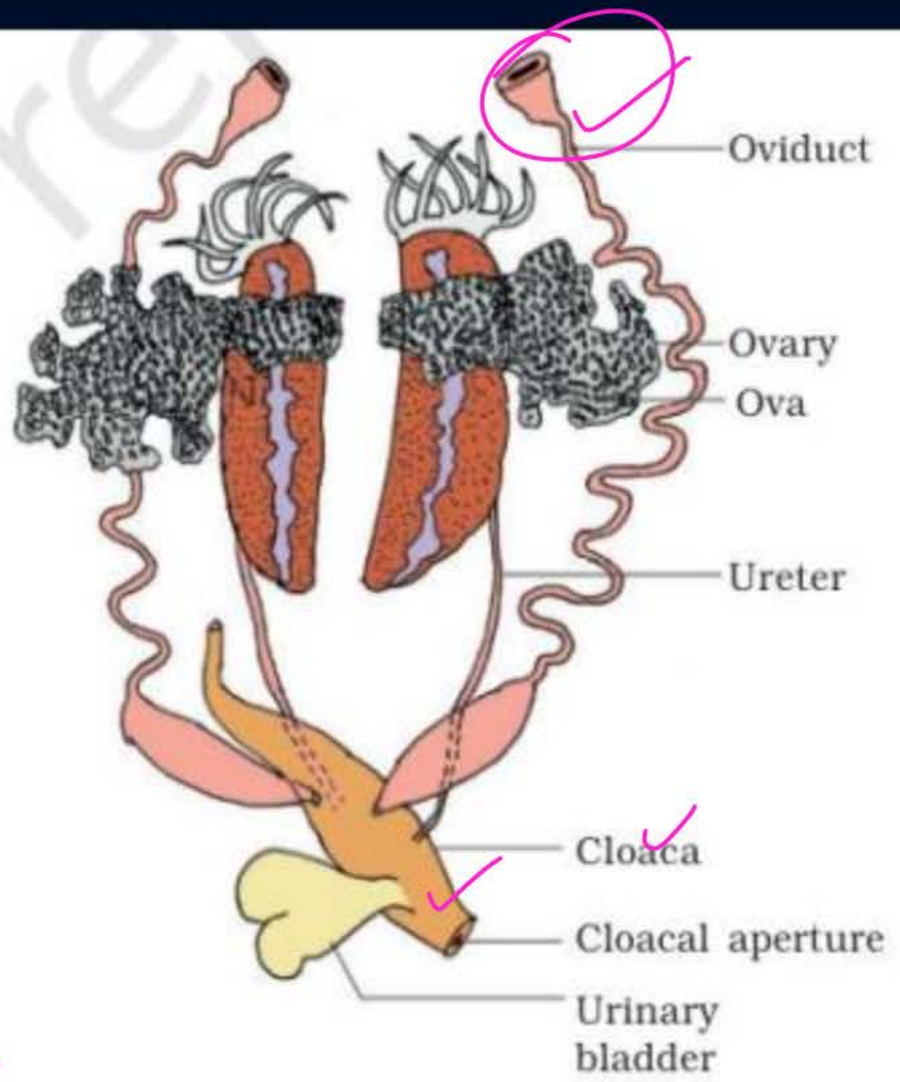


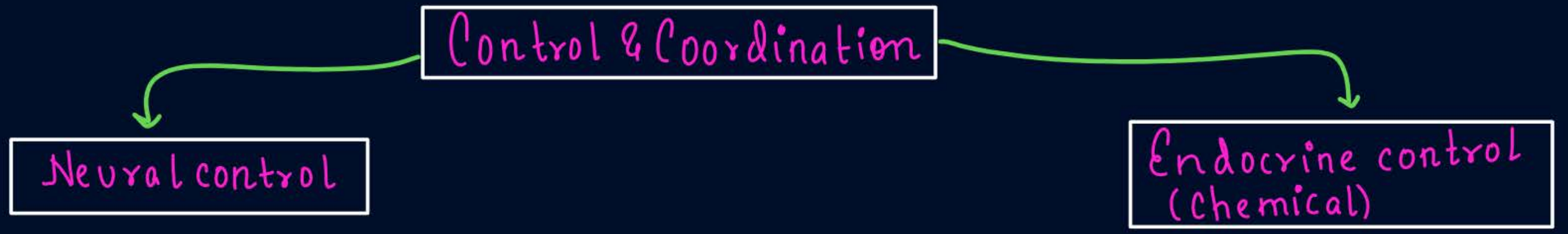
Figure 7.4 Female reproductive system

canal. Finally it communicates with the urinogenital duct that comes out of the kidneys and opens into the cloaca. The cloaca is a small, median chamber that is used to pass faecal matter, urine and sperms to the exterior.

The female reproductive organs include a pair of ovaries (Figure 7.4). The ovaries are situated near kidneys and there is no functional connection with kidneys. A pair of oviduct arising from the ovaries opens into the cloaca separately. A mature female can lay 2500 to 3000 ova at a time. Fertilisation is external and takes place in water. Development involves a larval stage called tadpole. Tadpole undergoes metamorphosis to form the adult.

Frogs are beneficial for mankind because they eat insects and protect the crop. Frogs maintain ecological balance because these serve as an important link of food chain and food web in the ecosystem. In some countries the muscular legs of frog are used as food by man.

CONTROL & COORDINATION: Well developed structures for Control & Coordination



- A few prominent endocrine glands are present that secretes hormones for the coordination.
  - Pituitary, Pineal, Thyroid, Parathyroid, Pancreatic islets, Adrenal, Gonads (Testis, Ovary).

Ncert catalyst
(H.W)

STATEMENT- **A triangular structure called Conus arteriosus joins the right atrium**

STATEMENT 2- **Sinus venosus receives blood through the major veins called vena cava.**

1. Statement I is correct but Statement II is incorrect.
2. Statement I is incorrect but Statement II is correct.
3. Both Statement I and Statement II are correct.
4. Both Statement I and Statement II are incorrect.

QUESTION

The number of vasa efferentia that arises from testes in frog's male reproductive system is;

1. 9 – 12
2. 10 – 12
3. 13 – 16
4. 16 - 19

QUESTION

Assertion(A): In frogs, a triangular structure called sinus venosus joins the right atrium.
Reason(R): The ventricle opens into a sac-like conus arteriosus on the dorsal side of the heart.

1. Both Assertion (A) and Reason (R) are true, and Reason (R) is a correct explanation of Assertion (A).
2. Both Assertion (A) and Reason (R) are true, but Reason (R) is not a correct explanation of Assertion (A).
3. Assertion (A) is true, and Reason (R) is false.
4. Assertion (A) is false, and Reason (R) is true.

Read the following statements and choose the **correct** option.

i. Frog respires in water by skin (cutaneous respiration).

ii. In frog, lymphatic system consists of lymph, lymph channels and lymph nodes.

iii. In frogs, during aestivation and hibernation gaseous exchange takes place through lungs only.

iv. Female frogs can be distinguished by the presence
of sound producing vocal sacs and also a copulatory pad on the first digit of the fore limbs which are absent in male frogs.

(A) i and ii correct only

(B) iii and iv correct only

(C) i and iii incorrect

(D) i, ii, iii, iv correct

Fully grown larva of frog respire through:

(A) moist skin

(B) buccal cavity

(C) gills

(D) all of the above

In frogs, food is captured by the __**i**__ . Digestion of food takes place by the action of ___**ii**___ and gastric juices secreted from the walls of the stomach. Partially digested food called ___**iii**__ is passed from stomach to the ____**iv**___.

(A) i- bilobed tongue, ii-HCl, iii- chyme, iv-duodenum.

(B) i- forelimbs, ii-HCl, iii- chyme, iv-duodenum.

(C) i- bilobed tongue, ii-HCl, iii- chyme, iv-middle part of small intestine.

(D) i- sharp tongue, ii-HCl, iii- chyle, iv-jejunum.

Q-12. READ THE FOLLOWING STATEMENT AND CHOOSE THE CORRECT ANSWER

STATEMENT 1- in frog, Male reproductive organs consist of a pair of yellowish ovoid testes, which are found adhered to the upper part of kidneys
STATEMENT 2- 10-12 pair vasa efferentia arises from each testes.

1. Statement I is correct but Statement II is incorrect.
2. Statement I is incorrect but Statement II is correct.
3. Both Statement I and Statement II are correct.
4. Both Statement I and Statement II are incorrect.

Q-15. READ THE FOLLOWING STATEMENT AND CHOOSE THE CORRECT ANSWER

STATEMENT 1- Each kidney is composed of only a very few structural and functional units called uriniferous tubules or nephrons.
STATEMENT 2- one pair of ureters is presnt in frogs

1. Statement I is correct but Statement II is incorrect.
2. Statement I is incorrect but Statement II is correct.
3. Both Statement I and Statement II are correct.
4. Both Statement I and Statement II are incorrect.

QUESTION

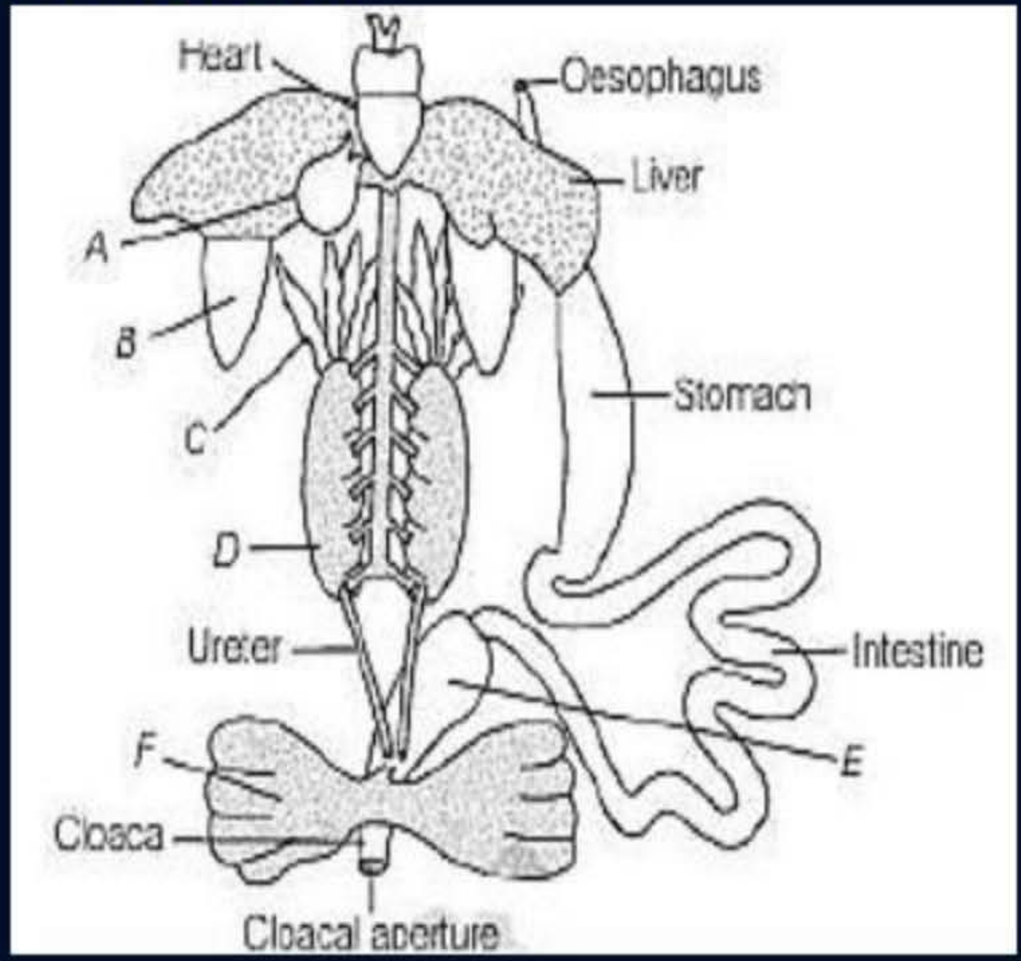
Given below is the diagram of internal organs of frog. Identify A to F.

1. A–Gall bladder, B–Lungs, C–Testis, D–Kidney, E–Urethra, F–Urinary bladder

2. A–Gall bladder, B–Lungs, C–Fat bodies, D–Kidney, E–Rectum, F–Urinary bladder

3. A–Gall bladder, B–Lungs, C–Ovary, D–Kidney, E–Ileum, F–Urinary bladder

4. A–Gall bladder, B–Lungs, C–Fat bodies, D–Kidney, E–Colon, F–Urinary bladder



QUESTION

In male frogs, cloaca is a small median chamber that is used to pass;

1. sperms
2. urine
3. faecal matter
4. All of these

1: Identify the incorrect statement amongst the following:

1. There is no functional connection of ovaries with kidneys in female frog.
2. In male frog, the ureter arises as urogenital duct and opens into the cloaca.
3. The fertilization in frog is external.
4. Development in frogs is direct.

Homework

- REVISE CLAASNOTES / ZOOLOGY MED EASY

MODULE HW
Module -2
Prarambh exercise 1- 9,10,21
Prabal ex 2- 2,3,7

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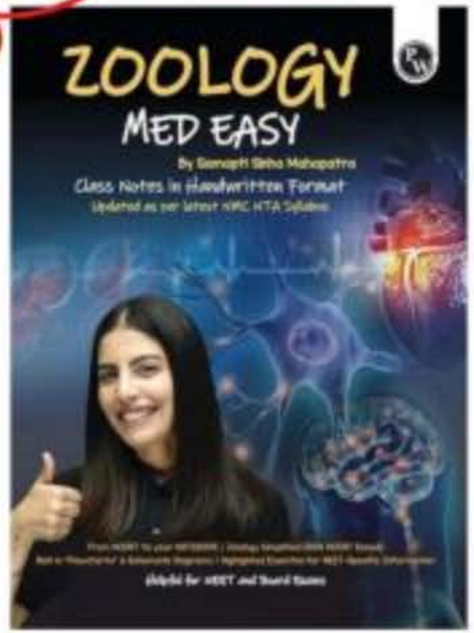

THANK YOU