

FROG.

- *Rana tigrina* - most common in India.
- » don't have constant temp = poikilotherms (cold blooded).
- » Summer sleep - aestivation.
Winter sleep - hibernation.
- » hide from enemies → camouflage
» this protective coloration = mimicry.

* Morphology -

- » Smooth & slippery skin → Mucus + cut.
always moist. → for cutaneous resp.
- » never drinks water, 'absorbs' thru skin.
- » Body divided

[→ <u>Head</u>
	→ <u>Trunk</u> . = <u>thorax + abdomen</u> .
- » Neck & Tail - nt.
"Pair of nostrils" above mouth + nt.
- » Nictitating membrane (3rd eye) + nt.
- » Membranous tympanum (ear) + nt.
= Internal + Middle + External.
 ↓ ↓
 single ossicle. tympanum.
- » Hind limbs = 5 digits, webbed for swimming.
Fore limbs = 4

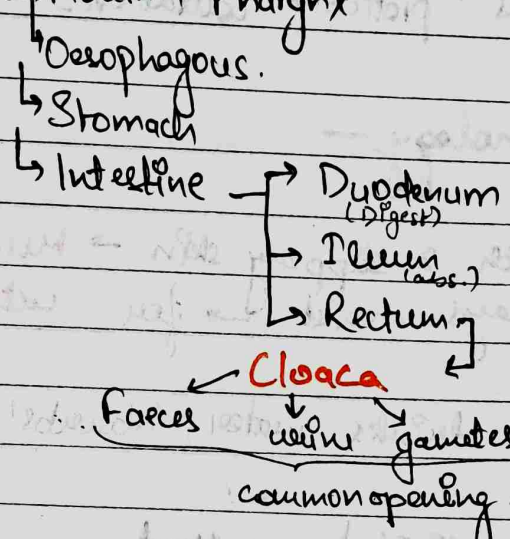
» Sexual dimorphism -

- ① Male → "vocal sacs" & "copulatory pad" on 1st digit of fore limbs.

* Anatomy -

① Digestive sys -

» Alimentary canal = Mouth + Pharynx



» Tongue = **Bilobed.**

» Digestion by → HCl & gastric juices.

» Partially digested food = **Chyme.**

» **Common bile duct** - Pancreatic juice + Gall bladder Bile.

» Bile → emulsify fat

» Pancreatic juice → Carbohydrates & Proteins.

» Absorption by villi & microvilli in intestine.

» undigested solid waste moves to rectum, out thru Cloaca.

② Respiratory -

- Resp. organs
 - Larva = "Gills"
 - Adult
 - Skin (water/aq. / cut. / hiber.)
 - Lungs (Pulmonary, land).
 - Buccal cavity.

→ Lungs → upper trunk region.
 Air → nostrils → buccal cavity → lungs.

→ Skin → dissolved O_2 exchanged by diffusion.

③ Circulation -

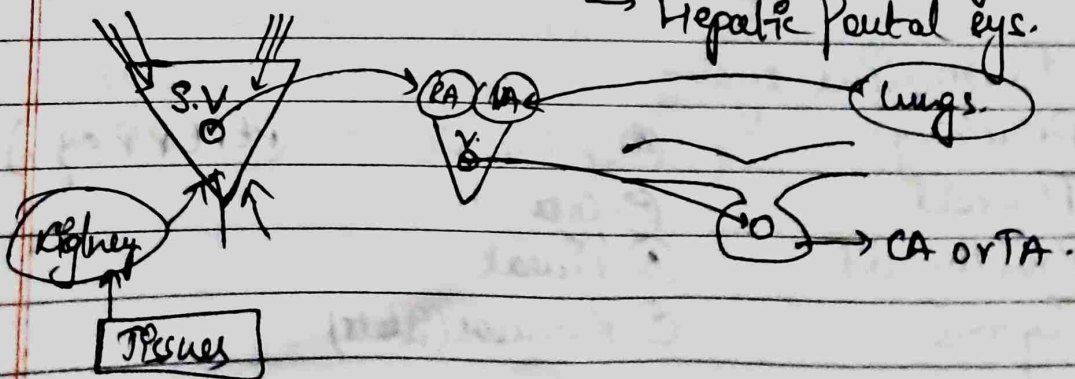
→ H₂O = 3 chamber heart, 2A & 2IV.
 close type.

→ Blood → red, RBCs nucleated & oval, WBCs.

→ Lymph → lymph vessels & lymph nodes.

→ Heart → muscular, upper part.
 covering = **Pericardium.**

→ Vessels + Portal vein → Renal Portal sys.
 Hepatic Portal sys.



- » **Sinus venosus** — joins RA, deoxygenated blood from kidneys & (from Hæmal) → Vena Cavae.
» Dorsal side.
- » **Conus arteriosus / Truncus arteriosus** — joins Ventricle, mixed blood, blood to aorta.
» Ventral side.
- » **Renal Portal system** = Kidney & Lower Body Parts.
- » **Hepatic Portal system** = Liver & Intestine.

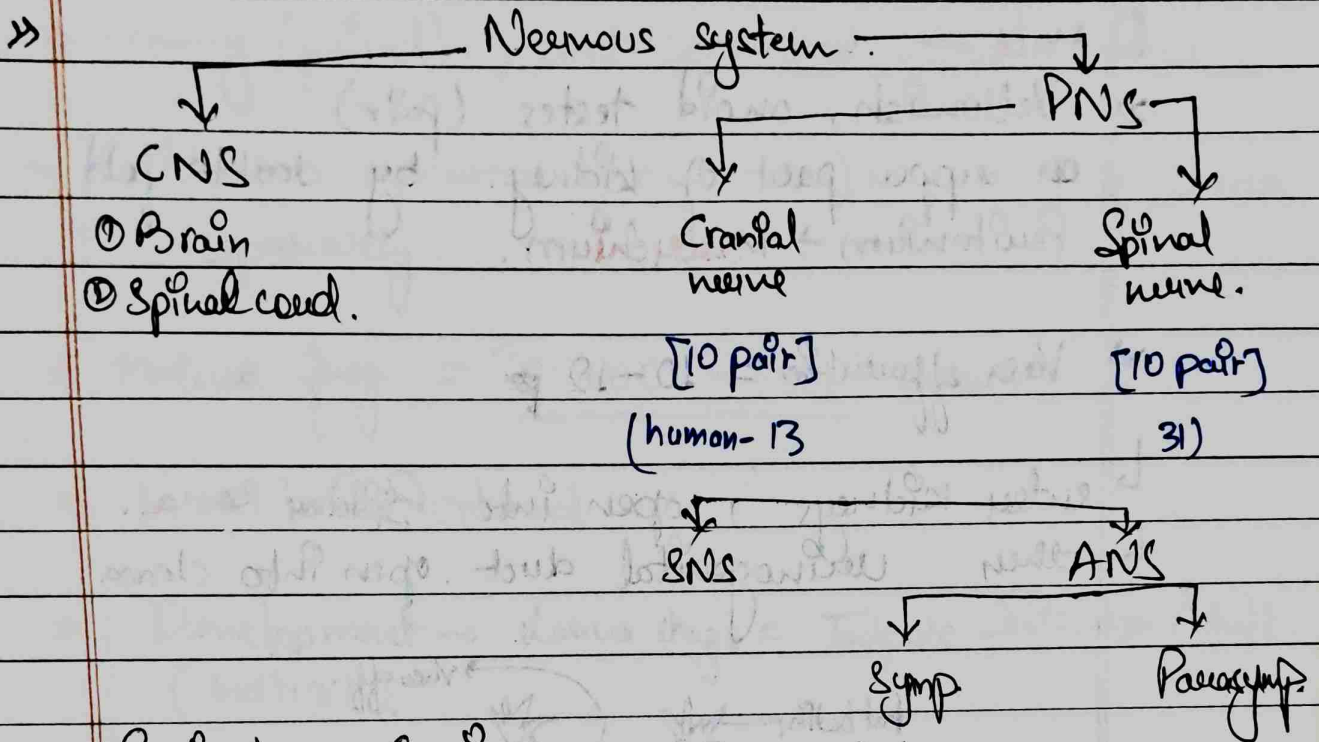
④ Excretory —

- » Mesonephric
- » Ureotelic → urea waste.
- » kidneys, ureter, cloaca, urinary bladder.
- » dark, compact, seed bean like str, ad posteriorly body cavity on both sides of vert. column.
- » Ureter = Urinogenital duct, opens into cloaca.
- » Urinary bladder → ventral to rectum, also open in cloaca.

⑤ Endocrine sys —

- | | | |
|---------------|---------------------|--------------------|
| ① Pituitary | ④ Adrenals | (P t P t P P a g.) |
| ② Thyroid | ⑤ Gonads. | |
| ③ Parathyroid | ⑥ Pineal | |
| ⑦ Thymus | ⑧ Pancreas (islets) | |

⑥ Nervous system -



» Brain box = Cranium.

- ~~Head~~ br. Fore br = Olfactory, cerebral hem, ^{paired} dicephalon.
- Mid br. = optic lobe pair. ^{unp.}
- Hind br. = cerebellum, Medulla Oblongata,
 passes out thru foramen magnum, continues to spinal cord enclosed in Vertebral column.

* Sensory Organs -

- | | | |
|-----------|---|--------------------------|
| ① Touch | → Sensory Papillae. | } cellular aggregations. |
| ② Taste | → taste buds. | |
| ③ Smell | → nasal epithelium. | |
| ④ Vision | → eyes (simple). | } well organised. |
| ⑤ Hearing | → tympanum with int. ears.
(for balancing too) | |

⑦ Reproduction —

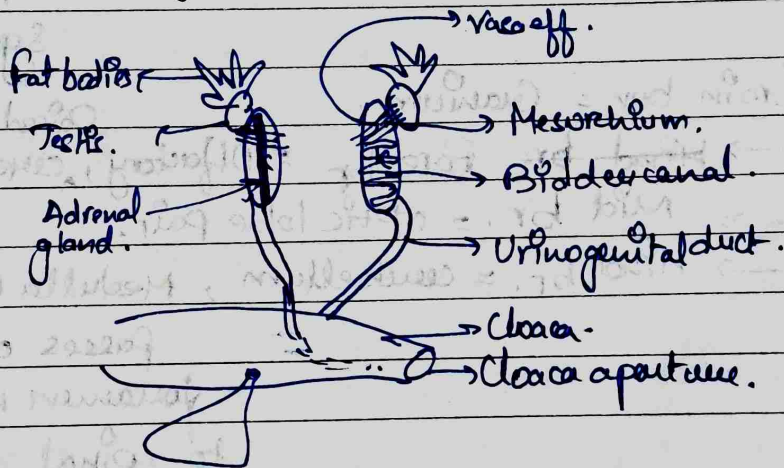
① Male —

» Yellowish, ovoid testes (pair)
 on upper part of kidney. by double fold
 Peritonium → **Mesorchium**.

» Vasa efferentia = 10-12

↳ enter kidneys, open into **Bidder canal**.

↳ then **Urogenital duct** open into cloaca.



» Testis → seminiferous tubules → **formation of sperms**.

↳ V.e. (10-12)

↳ BC.

↳ UG.

↳ C.

① Female -

- » Ovary (paired), not connected with kidneys
- » Oviduct (separated from uterus), open into cloaca separately.
- » Mature frog = "25000 - 3000" ovas.
- » Fertilisation external.
- » Development → Larva stage = Tadpole $\xrightarrow{\text{Metamorphosis}}$ Adult.
(Indirect).