# Chapter– 7

## Structural Organization in animals

**Tissue - a group of similar cells along with intercellular substances perform a specific function. Such an organization is called tissue.**

**Organ - a collection of tissues that work together to perform a specific function.**

**Organ system - a group of organs that work together to perform a specific function or task.**

**FROG -**
**General Classification -**
**Kingdom – Animalia**
**Phylum – Chordata**
**Class – Amphibia**
**Genus – Rana**
**Species – Tigrina**

**General Characteristics – [Morphology]**

**These animals are generally terrestrial but require water for reproduction .**

**Body is divided into head and trunk.**
**Skin has large number for mucus producing glands which keep it moist.**

**They can change their body color with the surroundings {camouflage} this property is known as mimicry.**

**They undergo both deep summer sleep [aestivation] and deep winter**

**sleep [hibernation] .**

**Skin has olive green color with yellow patches on it. A yellow colored dorsal line extended from head to last part of body .**

**2 pair of legs with webbed feet help in movement , jumping , burrowing and leaping .**

**Sexes are separate , fertilization is external and development is indirect [Larval stage].**

**Forelegs contain 4 digits , while Hind leg has five digits.**

**A pair of eye are present on the top of head , Nictitating membrane keep them moist .**

**Just behind the eyes is Tympanic membrane which act as ears .**

**Mouth is at the anterior part of the Snout.**

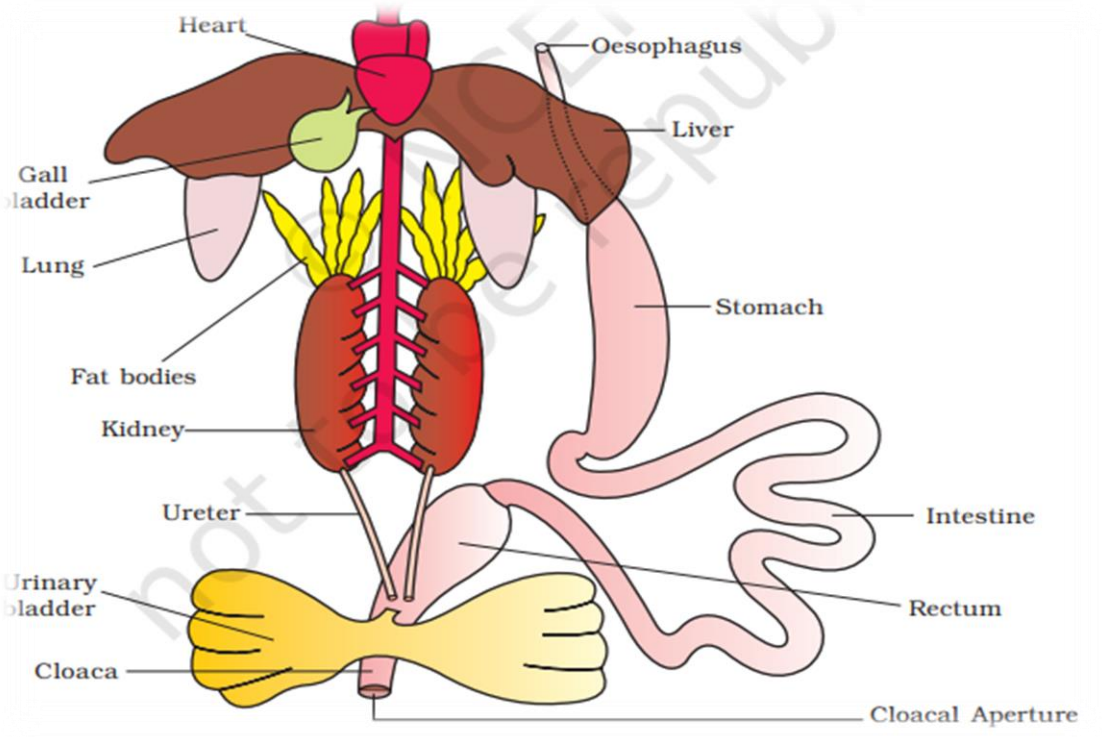
## [Anatomy]

### Digestive System of Frog -

The alimentary canal and digestive glands make up frog's digestive system.
Frogs are carnivorous in mode of nutrition hence the alimentary canal is short resulting in shorter gut .
Through the pharynx, the mouth opens into the buccal cavity, which leads to the oesophagus. Due to the lack of a neck, the oesophagus is a narrow tube.

**The** alimentary canal includes – Buccal cavity , Oesophagus , Stomach , Intestine , Rectum , Cloacal opening (common opening).

The digestive glans includes – Liver , Pancreas , Gastric juices in stomach and Duodenum .




**Reproduction in frog** – Frog shows sexual dimorphism in males and females .

#Adult frogs are ureotelic, excreting nitrogenous waste as urea, while their larval stage (tadpoles) are ammonotelic, excreting ammonia

#IMPORTANT -

| Male | Female |
| --- | --- |
| They have vocal sac to provide sound. | They lac vocal sac . |
| They have copulatory pads on the first digit of forelimbs | The copulatory pads are absent on the digits of forelimbs |

## Male reproductive system -

Includes – 1. A pair of testis
2. Vasa efferentia
3. Seminal vesicle
4.Ureter
5. Cloaca

1. A pair of testis – Oval shaped organ preset on the top of the kidneys attached by a double walled peritoneum known as Mesorchium.

2. Vasa Efferentia – From testis 10 to 12 vasa efferentia arise which open into the Bidder's canal inside the kidneys .

3. Seminal Vesical – a pair og elongated seminal vesical are present to provide nourishment , fluid medium .

4. Ureter – Thin tubes which carry both sperm as well as urine to cloacal chamber .

5. Cloaca – a common cavity at the end of digestive tract for the release of both excretory and genital products .

## Female Reproductive System -

Includes – A pair of ovaries and oviduct

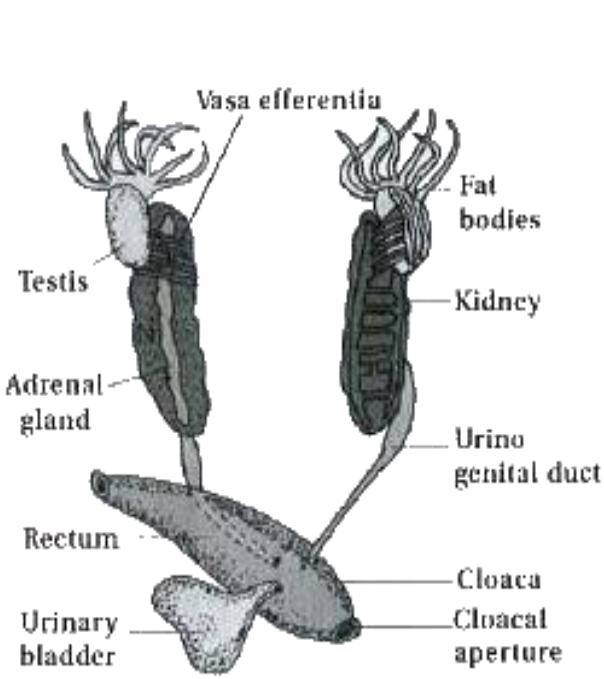
1. A pair of ovaries – Ovaries are found near the kidneys but they are not functionally connected with the kidneys.

2. Oviduct – a) A pair of oviduct having funnel like openings are present

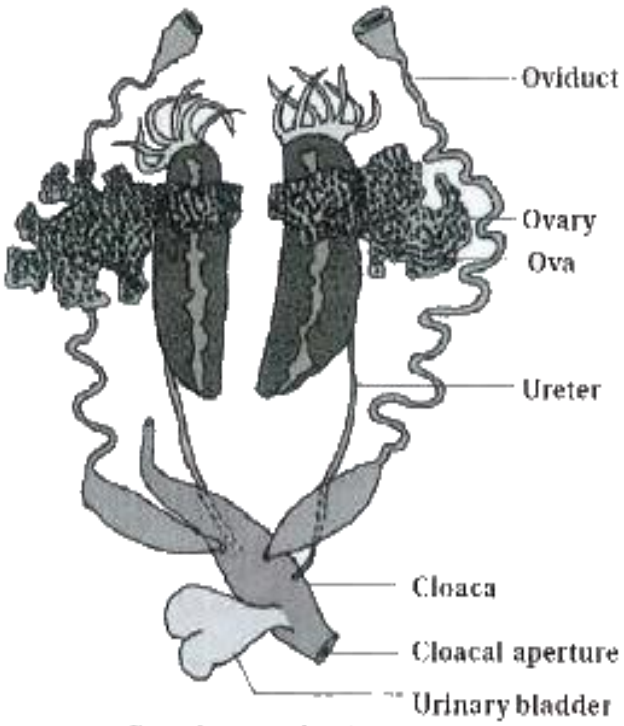
near the ovaries.
b) The oviduct carries egg/ova from the ovaries and open separately into the cloaca.

c) At a time the female frog produces 2500-3000 ova/egg for fertilization.

#Frogs shows external fertilization i.e. the male and female gametes are release in the water and fertilization takes place with the help of water as a medium of transport of gametes.



Male reproductive system



Female reproductive system

**Respiratory system in frogs** - Respiration in frogs takes place by 3 methods.

Cutaneous respiration

Buccal respiration

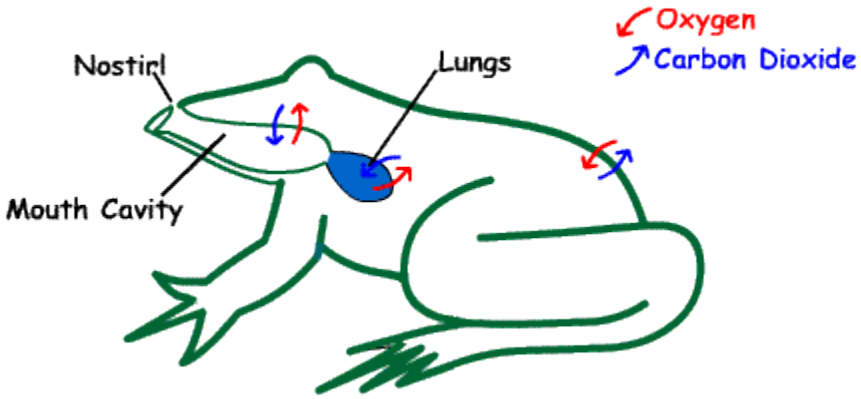
Pulmonary respiration

1. Cutaneous respiration – Respiration through skin. Skin function as a organ for respiration in water .

Skin also helps in gaseous exchange during hibernation and aestivation.

2. Buccal respiration – The buccal cavity in frog iss richly supplied with blood vessels and therefore exchange of gases takes place by buccal cavity.

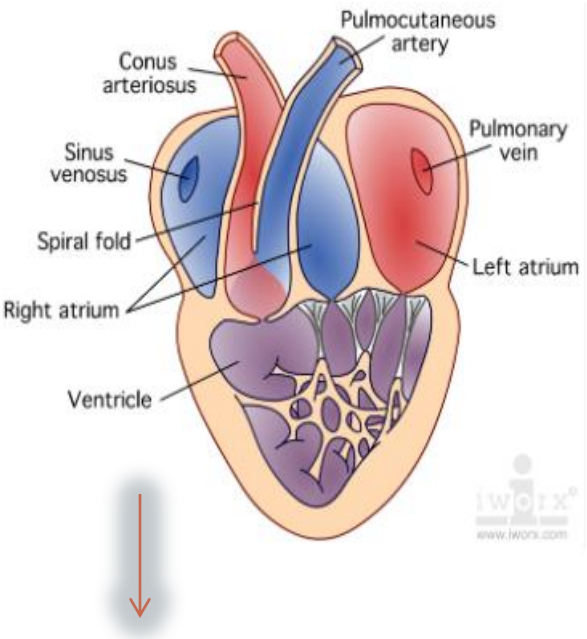
3. Pulmonary respiration – respiration through lungs. A pair of pink color, elongated sac like lungs are present in the trunk of frog .

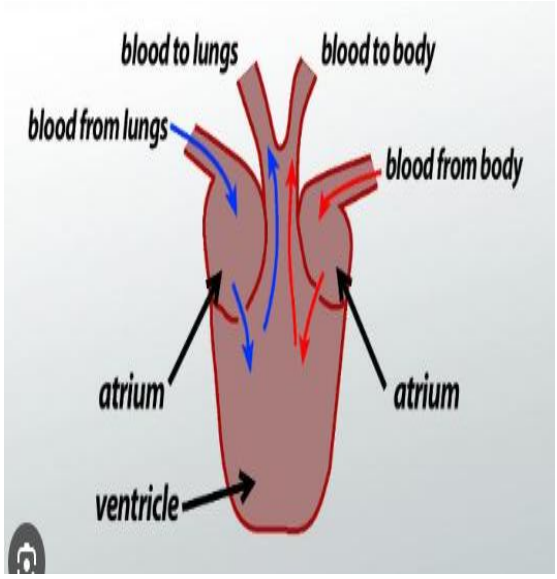



**Circulatory System in Frog** – Frogs have close circulatory system i.e. Blood is always contained within vessels.
It includes – Heart , blood and blood vessels .
Heart in three chambered having 2 atrium and 1 ventricle .

Mixing of oxygenated and deoxygenated blood occurs.

A membranous pericardium covers the heart and the right atrium is joined by sinus venous .
Vena cava is the major vein that carried blood to right atrium , the ventral side of the heart the ventricle opens into a sac like structure conus arterious .




Frog Heart

**Nervous system of frog** - It includes brain and spinal cord . Brain can be divided into forebrain , midbrain and hind brain.

Frog brain –

1.Forebrain – It includes- Olfactory lobes and Cerebrum .

a) Olfactory Lobes: Process smells and are located at the anterior end of the brain.

b) Cerebrum: The "thinking center" of the frog, involved in higher-level functions.

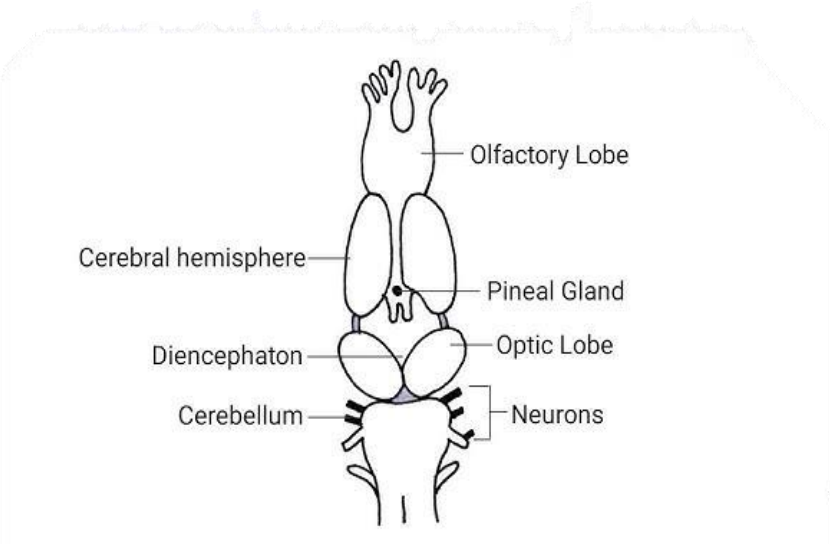
2. Midbrain includes –

Optic Lobes: Process visual information.

3.Hindbrain includes -

a) Cerebellum: Coordinates muscle activity and maintains balance.

b) Medulla Oblongata: Regulates involuntary functions like breathing, heart rate, and digestion. It also connects the brain to the spinal cord.




**Endocrine System** – It includes Thyroid gland , Thymus gland , pancreatic islets , pituitary gland , parathyroid gland , pineal gland and adrenal gland.

- WHAT IS METAMORPHOSIS?

  Metamorphosis is a developmental process where an organism transforms from one form to another, involving distinct stages and drastic physical changes.

In frogs, Tadpole undergo metamorphosis to form the adult .

## Benefits -

- They are beneficial for mankind because they eat insects and protect the crops .

- ❖ They maintain ecological balance because these serves as an important link of food chain and food web.
- ❖ In some countries the muscular legs of frog are used as food by man.


#The diagram of the heart and brain of the frog is not given in the book. These diagrams are given just for your understanding in this pdf !!