

NEET CRASH COURSE

Animal Kingdom



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Animal Kingdom

Characteristics of Animals

1. Multicellular ✓
2. Eukaryotic ✓
3. Heterotrophic ✓ - Holozoic, Saprophytic, Parasitic
4. Have to digest food
5. Lack cell walls
6. Ability to move ✓

7. Neuron → Porifera (sponges)

do not
→ Porifera, Hydra
→ Sessile / sedentary



Animal Kingdom

Animals are classified into 11 phylums- 9 Major

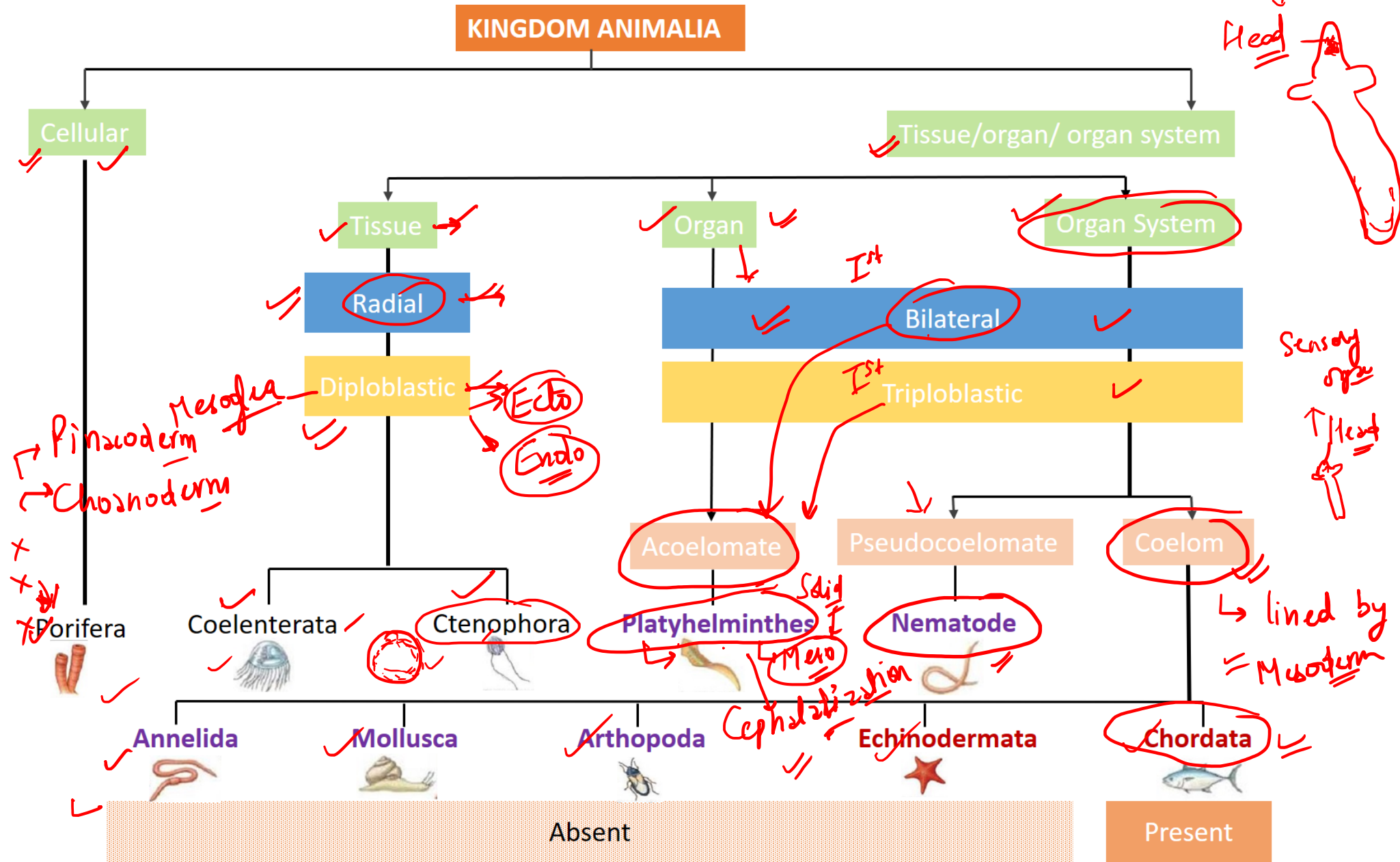
Phylum	Examples	Evolutionary Milestone
① Porifera	sponges	multicellularity
② Cnidaria	jellyfish, hydra, coral	tissues
④ Platyhelminthes	flatworms	bilateral symmetry
⑤ Nematoda	roundworms	pseudocoelom
⑧ Mollusca	clams, squids, snails	coelom
⑥ Annelida	earthworms, leeches	segmentation
⑦ Arthropoda	insects, spiders, crustaceans	jointed appendages
⑨ Echinodermata	starfish	deuterostomes
⑩ Chordata	vertebrates	notochord

③ Ctenophore
sea-goose
bony

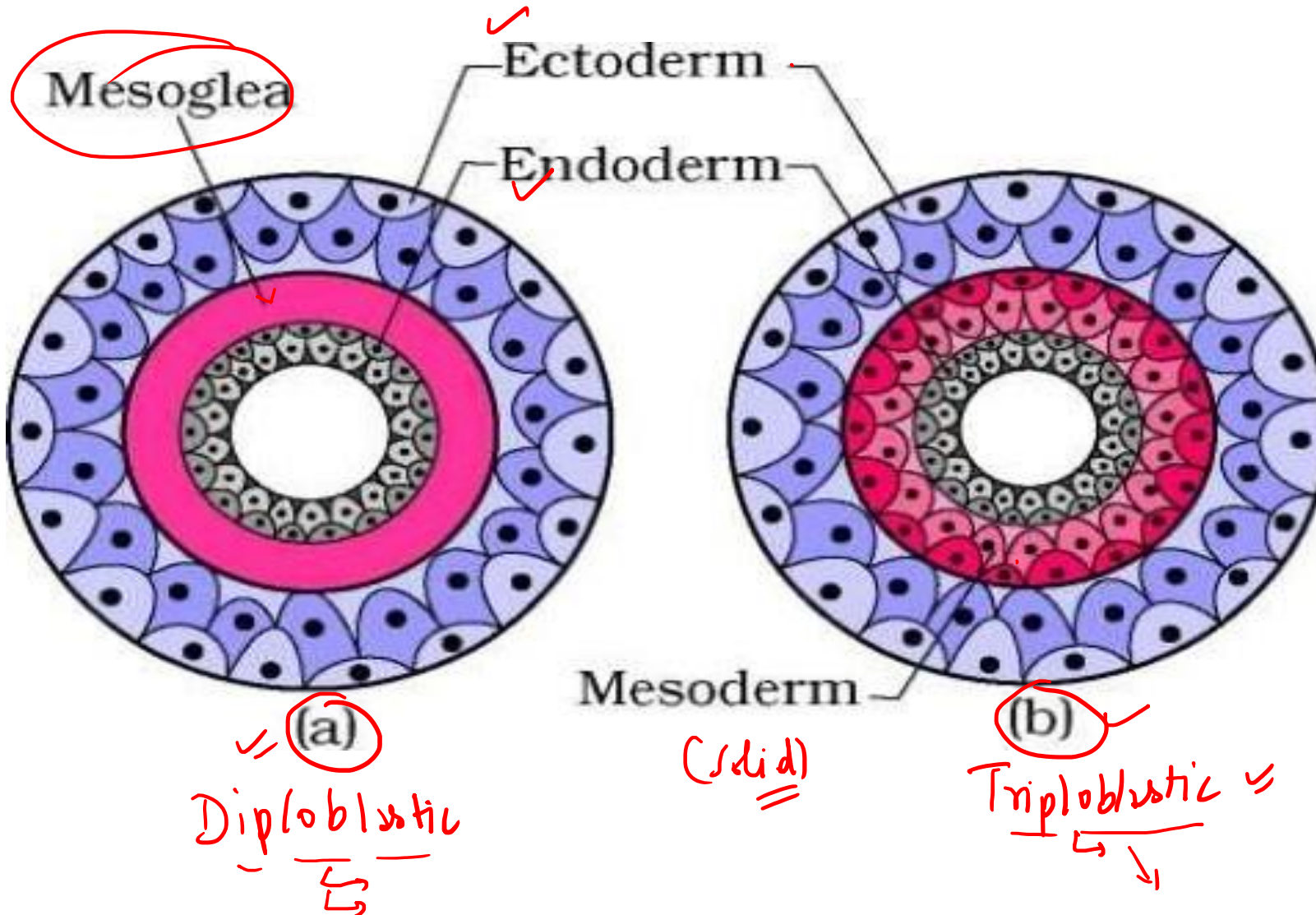
⑩ Hemi

crab
aquatic prawn

Animal Kingdom (Basis of classification)

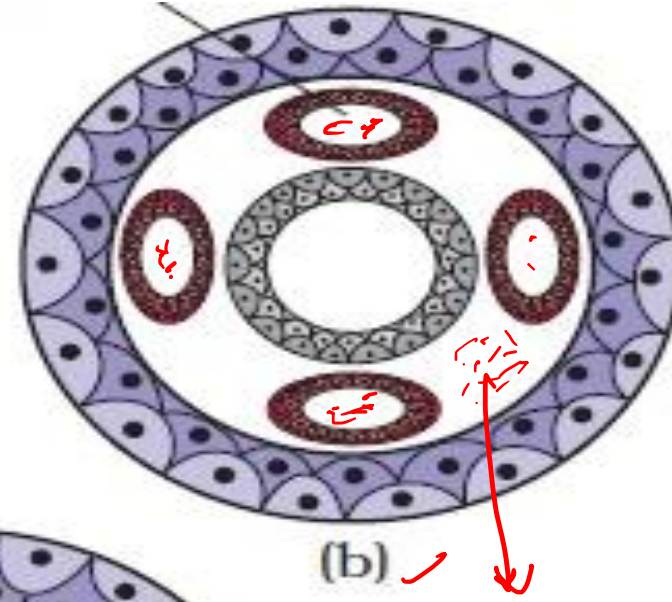
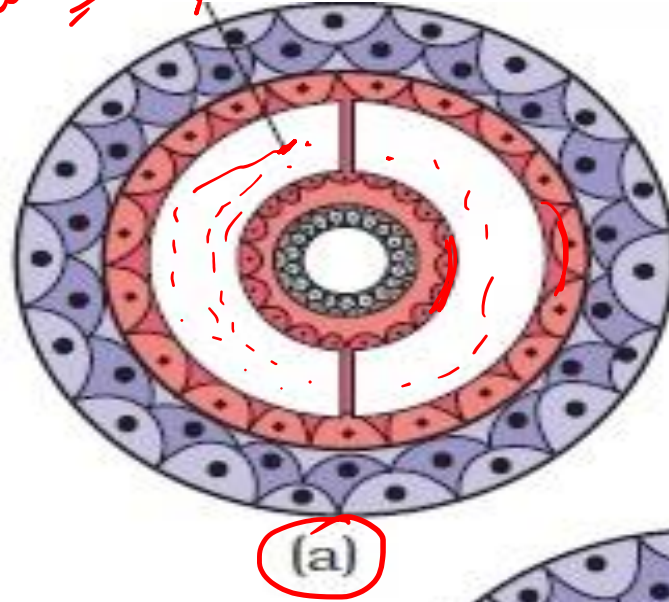


Animal Kingdom (Basis of classification)

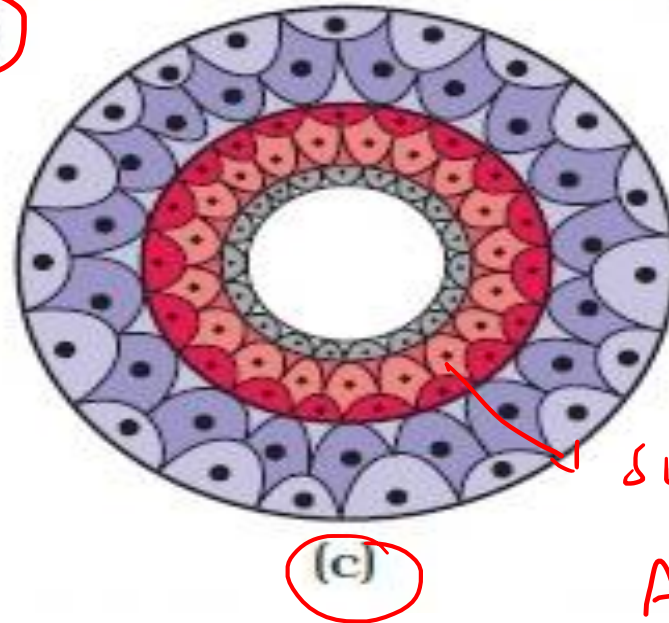


Animal Kingdom (Basis of classification)

True coelom



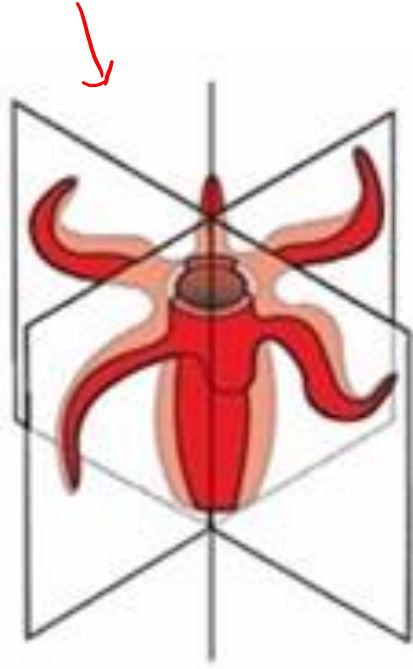
B
Blastocoel



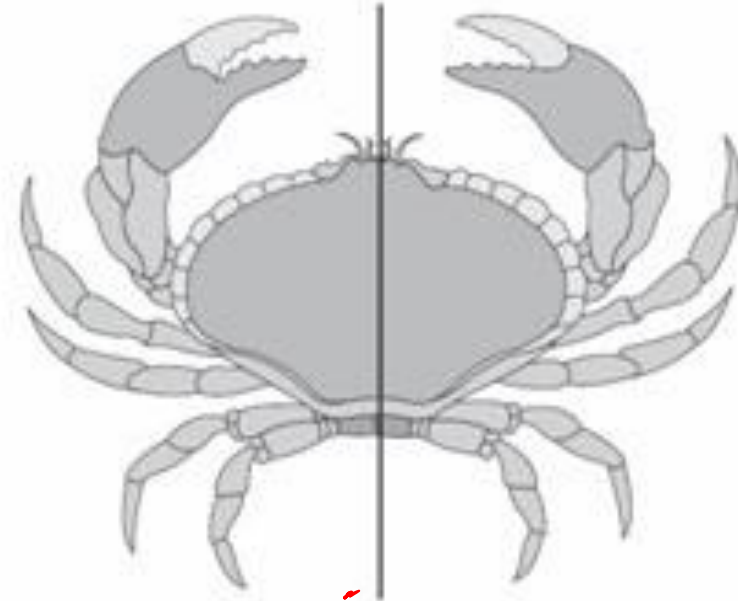
Solid Mesoderm

Acoelom

Animal Kingdom (Basis of classification)



(a)



(b)

Animal Kingdom

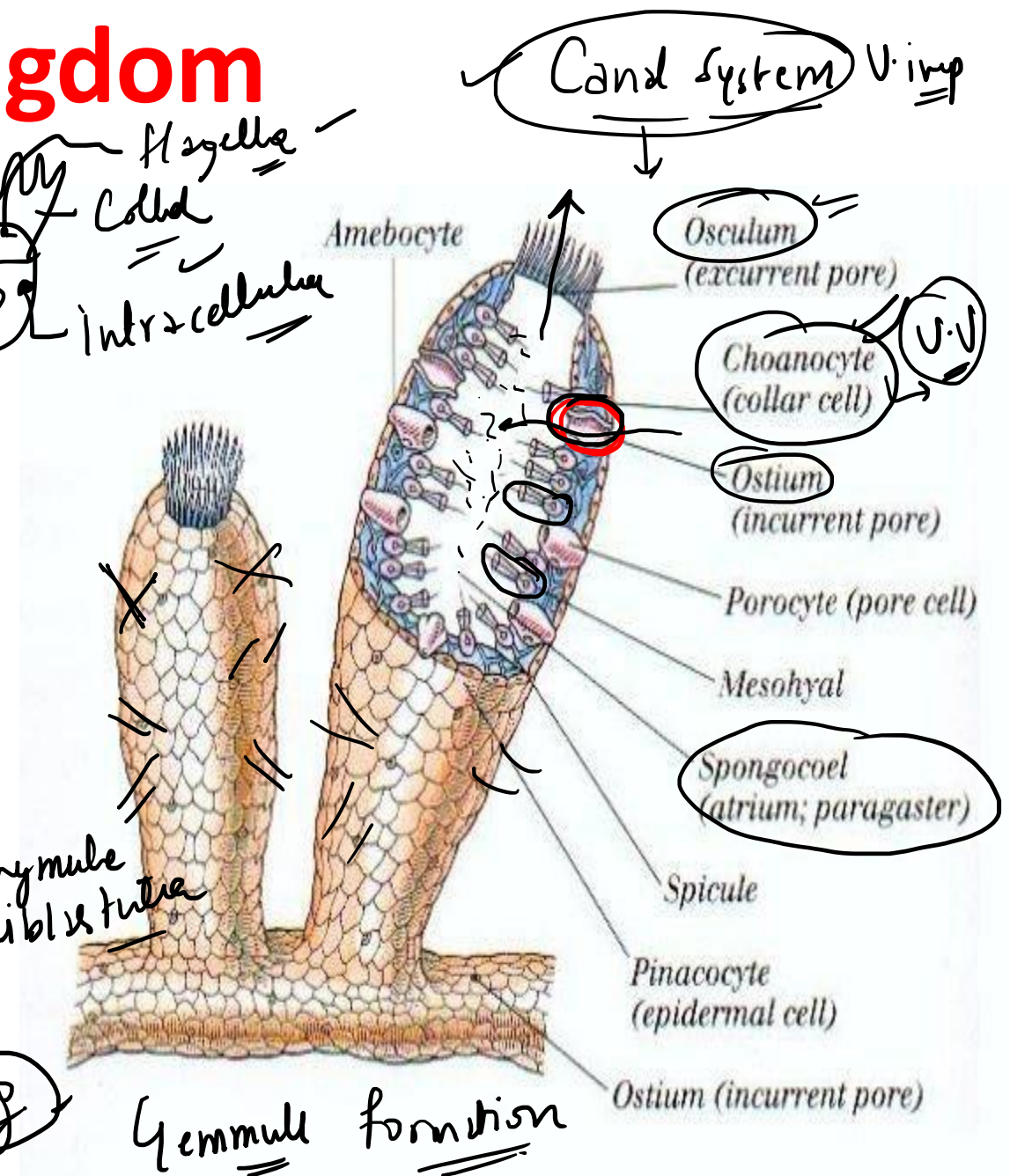
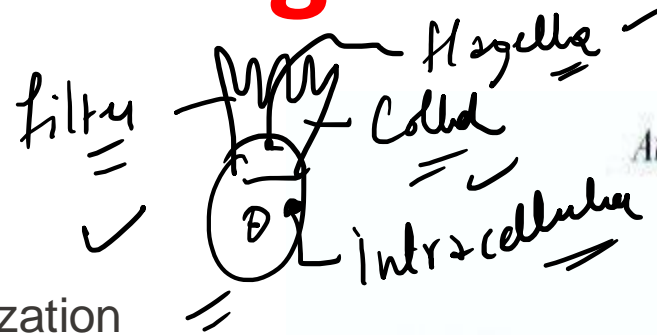
Phylum-Proifera

- Commonly called as Sponges
- Marine & asymmetrical
- Primitive multicellular with cellular level organization
- Water transport/canal system present. Many small opening called ostia present on body wall thro which water enters leading into a central body cavity – Spongocoel that leads out through a single large opening called osculum
- Food enters the body along with water the Ostia. Choanocytes /collar cells live the spongocoel & canal in the body wall that trap the food & digest it within the intracellular digestion
- Body has a skeleton made up of spicules / sponging fibres.
- Hermaphrodite ✓
- Reproduce internal and development is indirect having larval stage that is different from adult

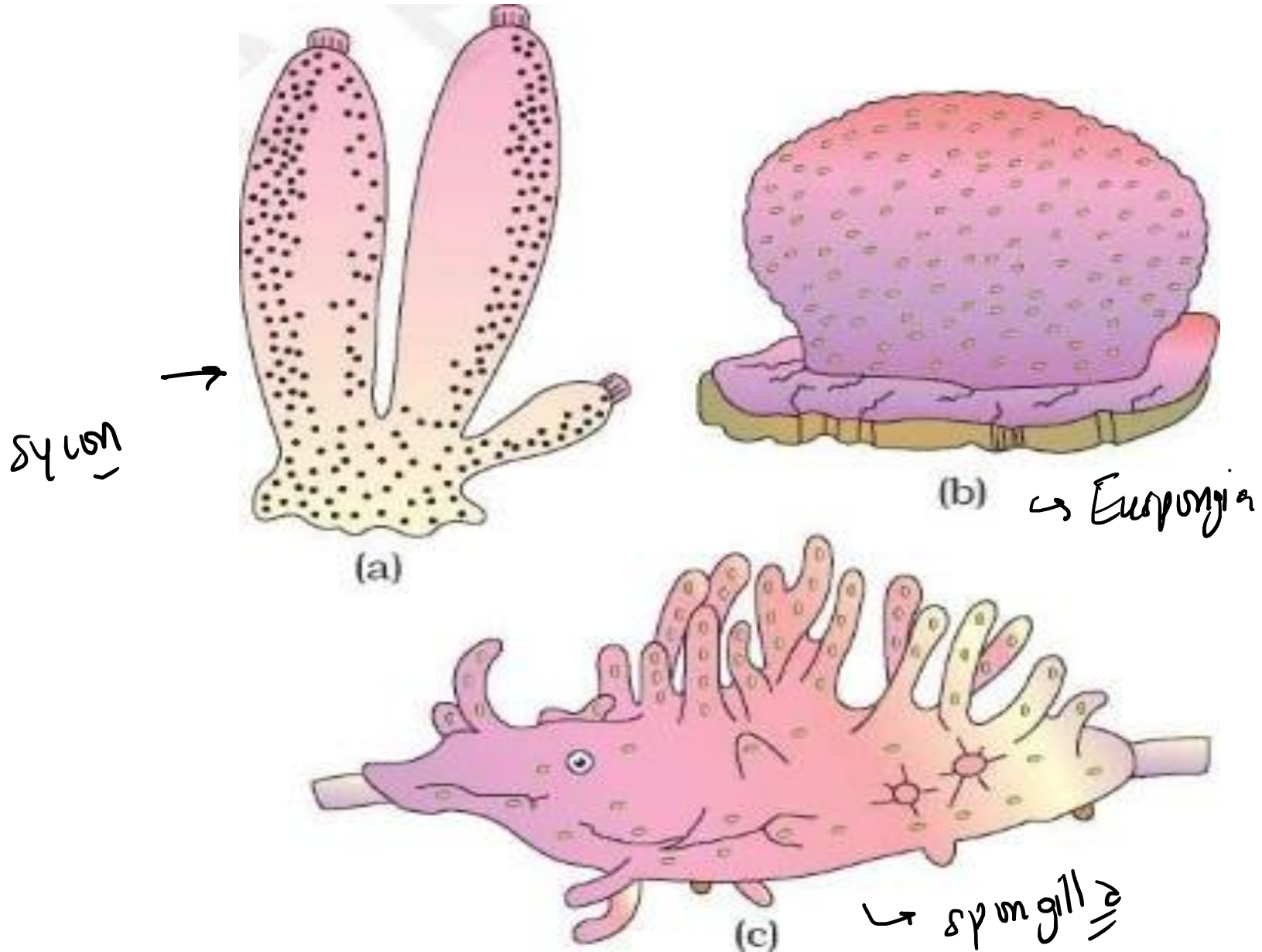
Eg. Sycon, Spongilla, Euspongia, Cliona, Euplectella

(Scypha)

Boring sponge



Animal Kingdom



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Phylum – Coelenterata (Cnidaria)

- Aquatic, mostly marine *✓ Fresh → Hydra.*
- Sessile or free – swimming *✓*
- Radially symmetrical animals *✓*
- The word 'cnidaria' derived from the word 'cnidoblasts'/cnidocytes present on tentacles for capturing prey & defense. It has stinging capsules or nematocytes

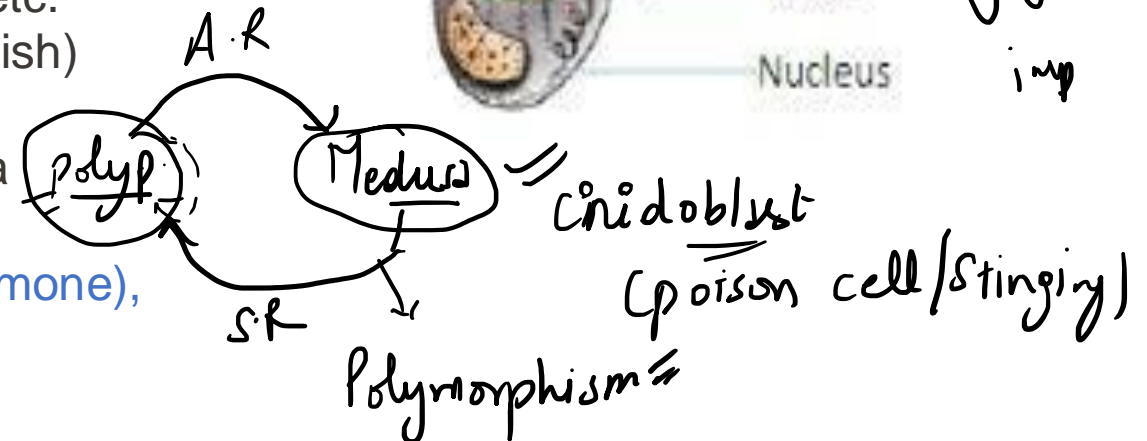
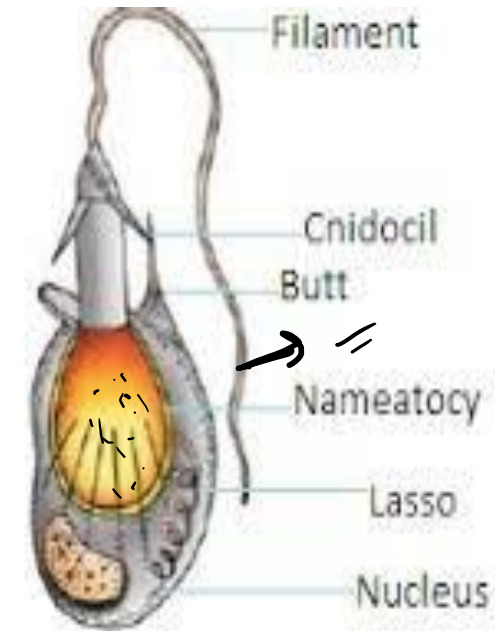
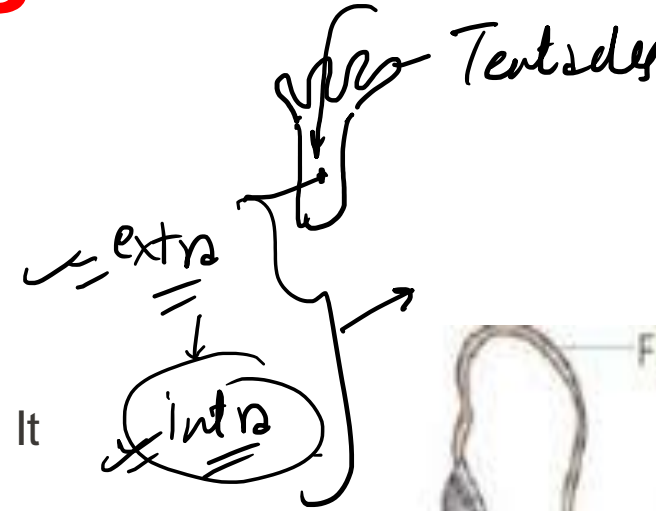
- A central gastro-vascular cavity called coelenterons present that opens to outside through a single opening – hypostome

Digestion is partly extracellular & partly intracellular

- Some of them have skeletons made of CaCO_3 eg – Coral *✓*
- These have tissue-level of organization Polyp & Medusa *✓*
- Polyp is a sessile & cylindrical form like Hydra, Adamsia etc.
- Medusa is like an umbrella, free swimming Aurelia (Jelly fish)
- Those having both stages show alternation of generation is

✓ Metagenesis Polyp produce medusa by asexually & medusa sexually produce polyp eg : Obelia, Physalia

Eg Physalia (Portuguese man of war), Adamsia (Sea anemone), Meandrina (Brain Cord)



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— Adamsia / Metridium
✓ (sea anemone)



(a)



(b)

Animal Kingdom

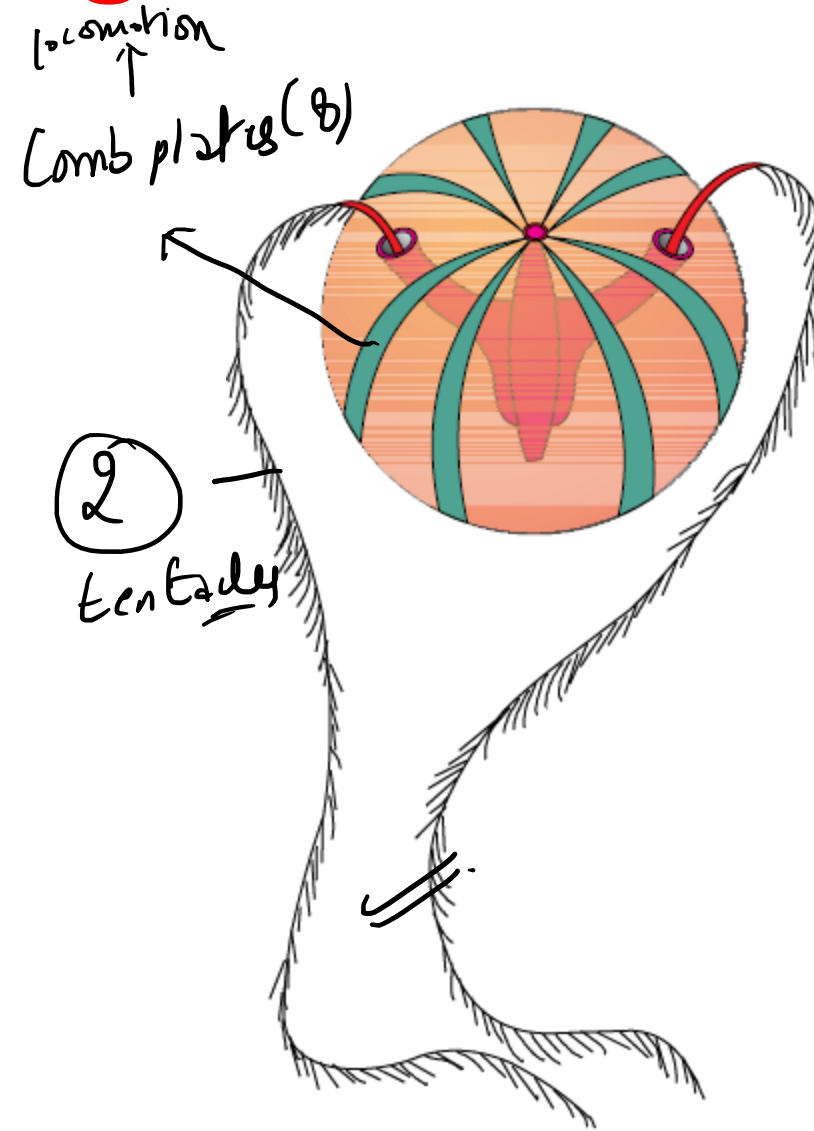
Phylum – Ctenophora ✓

- ☐ Commonly called sea walnuts
- ☒ Exclusively marine
- ☐ Radially symmetrical ✓
- ☐ Diploblastic with tissue level organization ✓
- ☐ Body bear & external rows of ciliated plates that help in locomotion
- ☐ Digestion – both extra & intracellular ✓
- ☒ Bioluminescence is seen in them
- ☒ Sexes are not separate //
- ☒ Reproduction by sexual means
- ☐ Fertilization is external with indirect development

Eg – Pleurobrachia ✓ and Ctenoplana ✓

= Bene.

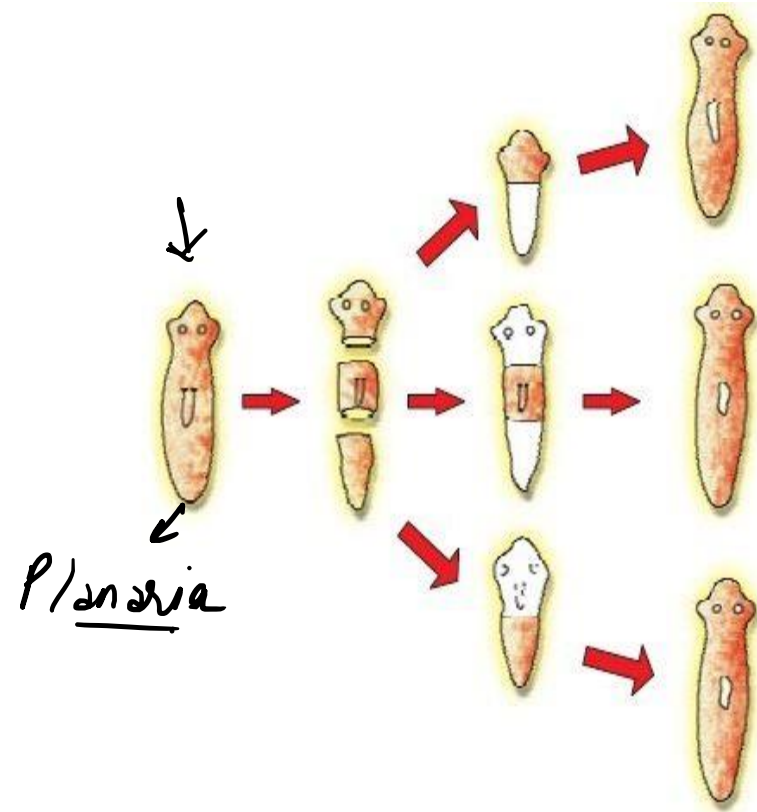
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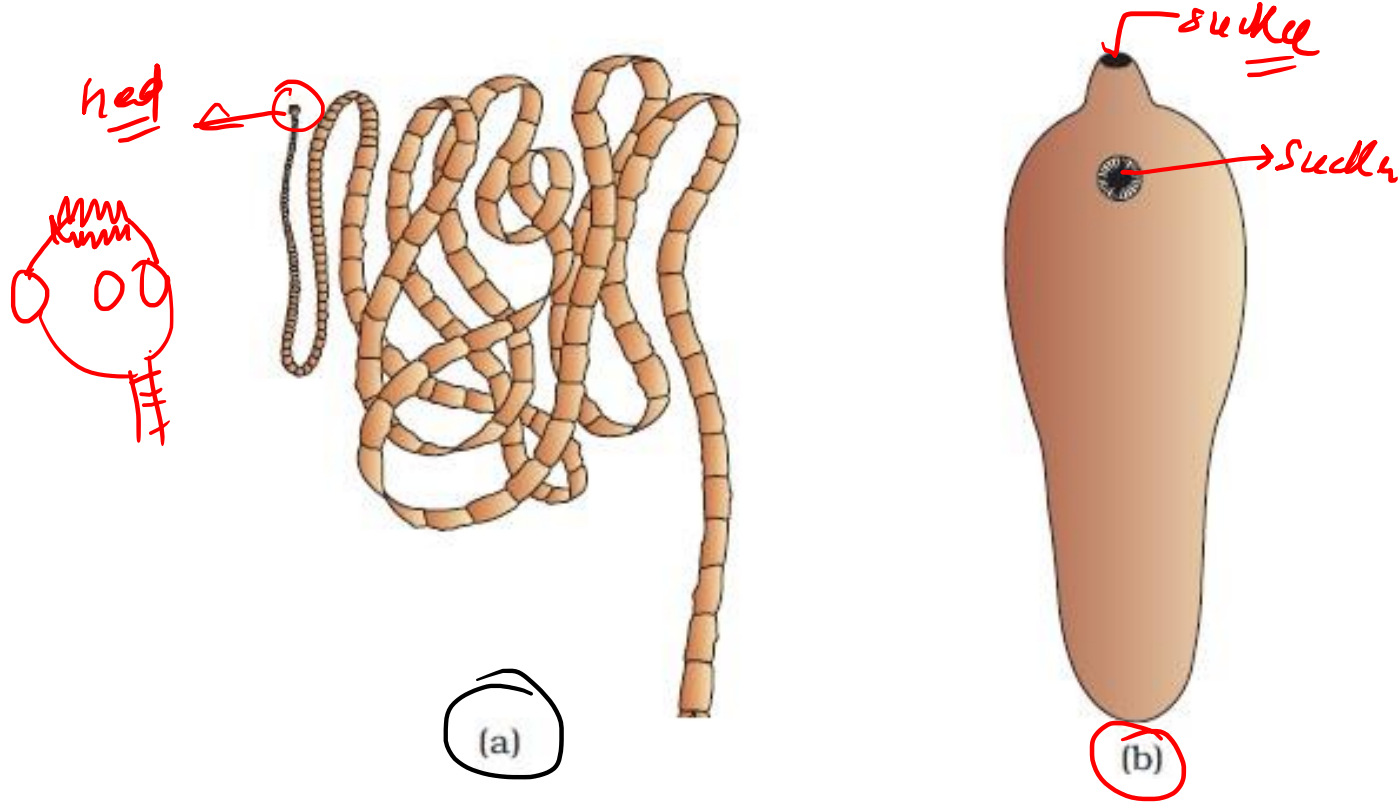
Animal Kingdom

Phylum – Platyhelminthes ^{flat worm}

- ☐ They have dorso-ventrally flattened body, hence are called flatworms
- ☒ Endoparasites found in animals including human beings
- ☐ Bilaterally symmetrical, triploblastic and acoelomate animals with organ level of organization
- ☒ Hooks and suckers are present in the parasitic forms
- ☐ Some of them absorb nutrients from the host directly through their body surface
- ☒ Flame cells help in osmoregulation and excretion
- ☐ Sexes are not separate
- ☐ Fertilisation is internal and development is through many larval stages
- ☒ Some members like Planaria possess high regeneration capacity
- ☐ Eg: Taenia (Tapeworm), Fasciola (Liver fluke).



Animal Kingdom

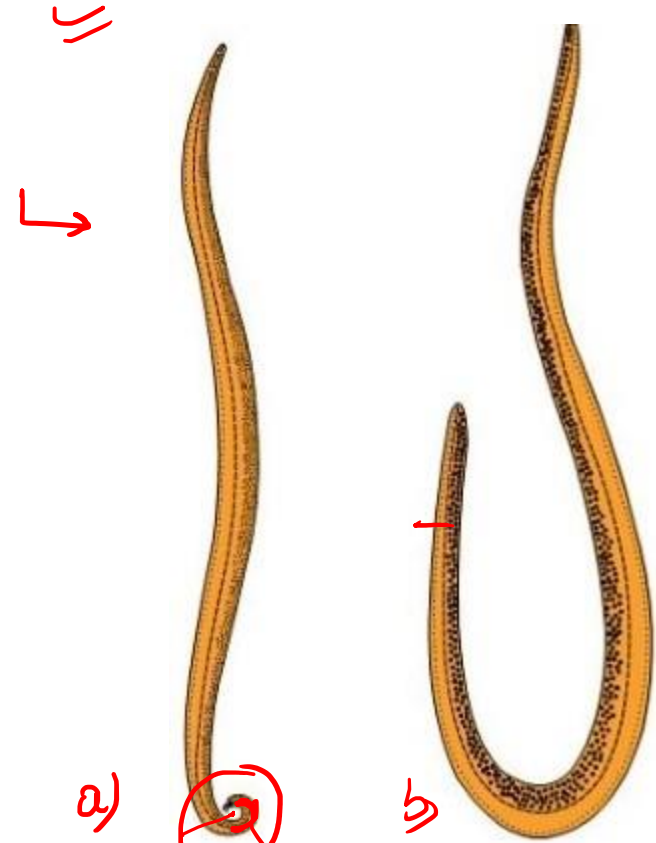


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Phylum – Aschelminthes = Round. worms

- Body of the aschelminthes is circular in cross-section, hence, the name roundworms.
- Free living, aquatic and terrestrial or parasitic in plants and animals
- They have organ-system level of body organization
- Bilaterally symmetrical, triploblastic and pseudocoelomate animals.
- Alimentary canal is complete with a well developed muscular pharynx
- Excretory tube removes body wastes from the body cavity through the excretory pore.
- Sexes are separated (dioecious), i.e., males and females are distinct.
- Often females are longer than males
- Fertilisation is internal and development may be direct (the young ones resemble the adult) or indirect.

Eg: Ascaris (Round Worm), Wuchereria (Filaria worm), Ancylostoma (Hookworm)



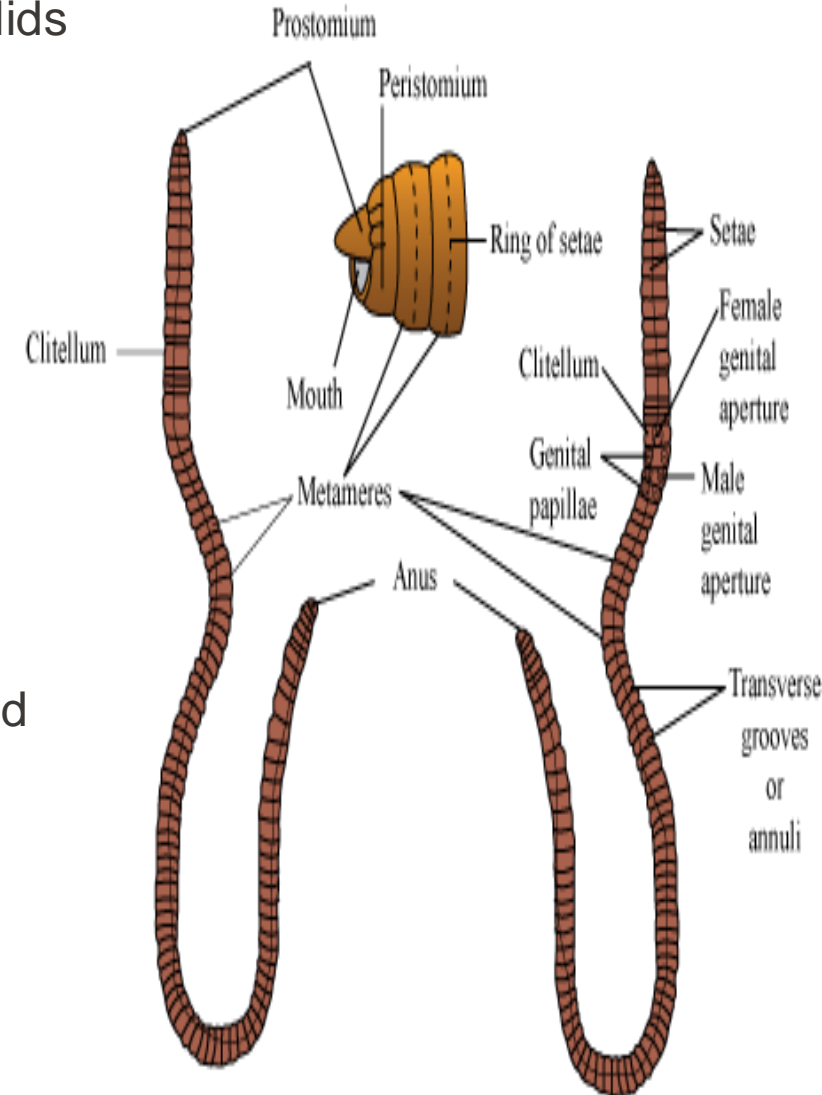
a) curved (♂)
sexual dimorphism
unsegmented

Ascaris

Animal Kingdom PYQs

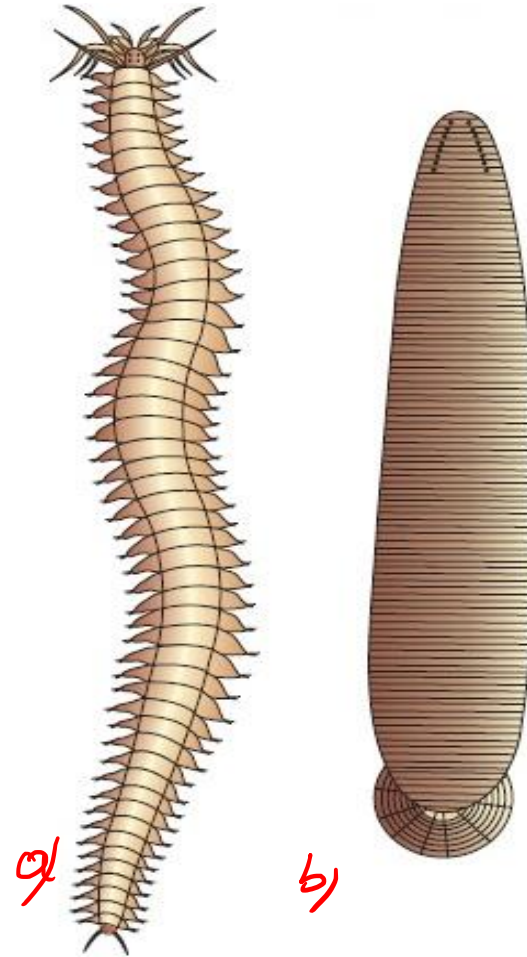
Phylum – Annelida (Earthworm) – segmented worm

- ✓ ☐ Metamerically segmented animal – segments looking like ring – so called Annelids
- ☐ True coelomate ✓ ↳ Metamerism
- ☐ Triploblastic ✓
- ☐ Bilateral symmetry ✓
- ☐ Organ-system level
- ☐ Body covered with cuticle secreted by ectoderm
- ☐ They possess longitudinal and circular muscles ✓
- ✓ ☐ Setae – locomotion organ in lower side. In some setae present on lateral appendages called Parapodia
- ☐ Alimentary canal has mouth & anus at opposite with muscular pharynx, oesophagus, stomach & intestine
- ☐ Excretory wastes called Casting ✗
- ✓ ☐ Closed circulatory system – a heart is seen with one dorsal & one ventral blood vessel except leech
- ✓ ☐ Respiration – through skin found in moist condition
- ✓ ☐ Nephridia help in osmoregulation and excretion solid
- ☐ Nervous system – 2 cerebral ganglia with double ventral nerve cord solid
- ☐ Sexes are separate except in leech & Earthworm – hermaphrodite ✓
- ☐ Larva is trochophore Nereis
- ☐ Eg: Pheretima (Earthworm), Hirudinaria (Blood sucking leech), Nereis, Aphrodite (clam)



Crea-mouse

Animal Kingdom



Animal Kingdom

Phylum- Arthropoda → Jointed appendages

- This is the largest phylum of Animalia which includes insects ✓
- The body of arthropods is covered by chitinous exoskeleton ✓
- The body consists of head, thorax and abdomen.
- Respiratory organs are gills, book gills, book lungs or tracheal system ✓
- Sensory organs like antennae, eyes (compound and simple), statocysts or balance organs are present ✓
- Excretion takes place through malpighian tubules ✓

Eg:- *Apis* (Honey bee), *Bombyx* (Silkworm),
Laccifer (Lac insect)
Vectors – Anopheles, Culex and Aedes



(a)



(b)



(c)



(d)

Limulus

→ Green gland
→ Coxal gland

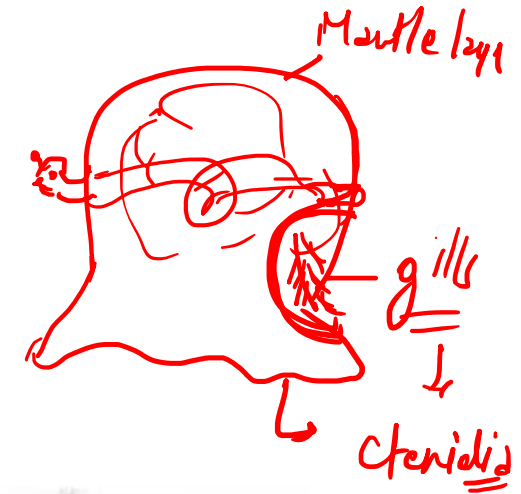
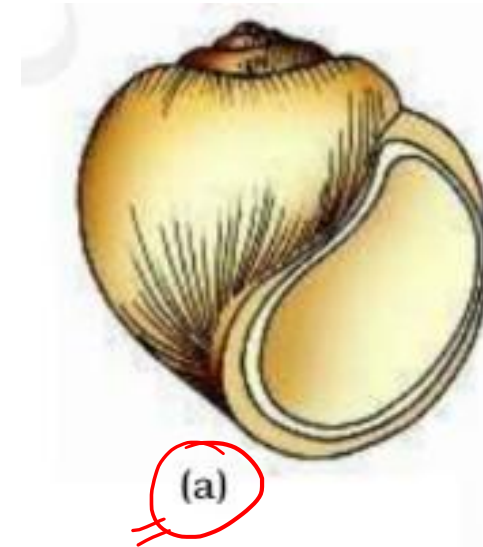
→ Palaemon

Animal Kingdom

Phylum – Mollusca → Unsegmented, soft:

- ☐ This is the second largest animal phylum
- ☐ Triploblastic ✓
- ☐ Coelomate ✓
- ☐ Bilaterally symmetrical ✓
- ☐ Terrestrial / aquatic ✓
- ☐ Body surrounded by calcareous shell (except slugs & octopus) Internal shell – sepia ✓
- ☐ Body – unsegmented – 3 part – head & ventral muscular foot & a dorsal visceral hump. Skin over visceral hump form a mantle that shell ✓
- ☐ Respiratory & excretory organs – gills present below mantle
- ☐ Head has tentacles
- ☐ Mouth has a file like rasping organ called Radula.
- ☐ Oviparous ✓ how
- ☐ Larva – trochophore / veliger

Eg *Pila* (Apple snail), *Pinctada* (Pearl oyster), *Sepia* (Cuttlefish), *Loligo* (Squid), *Octopus* (Devil fish)

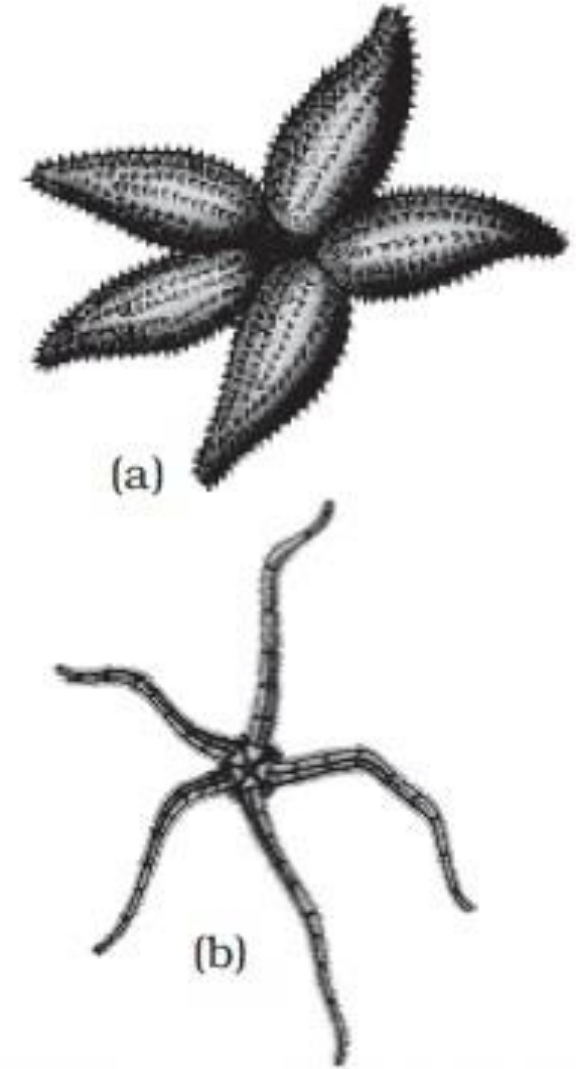


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Phylum – Echinodermata

- ☐ Ectoderm bear spines
- ☐ Marine *Exclusively.*
- ☐ Triploblastic ✓
- ☐ Coelomate ✓
- ☐ Adults are radially symmetrical – Body part in 5 axes (pentamerous radial symmetry) ↓
- ☐ Larvae- Bilaterally symmetrical ✓
- ☐ Exoskeleton – calcareous having plate – like structure called ossicles
- ☐ Mouth on lower side & anus an upper side
- ☐ Water vascular system present – radiating tube like appendages called tube feet- functions is locomotion , capturing food & respiration
- ☐ A nerve ring encircling the mouth from which 5 radial nerves begins supplying each arm. ✓
- ☐ Sexes separate with 5 pair of sex organ, one pair in each arm
- ☐ Fertilizations is usually external ✓
- ☐ Free -swimming larva. ✓

Eg : *Asterias* (Star fish), *Echinus* (Sea urchin), *Antedon* (Sea lily), *Cucumaria* (Sea cucumber), *Ophiura* (Brittle star).



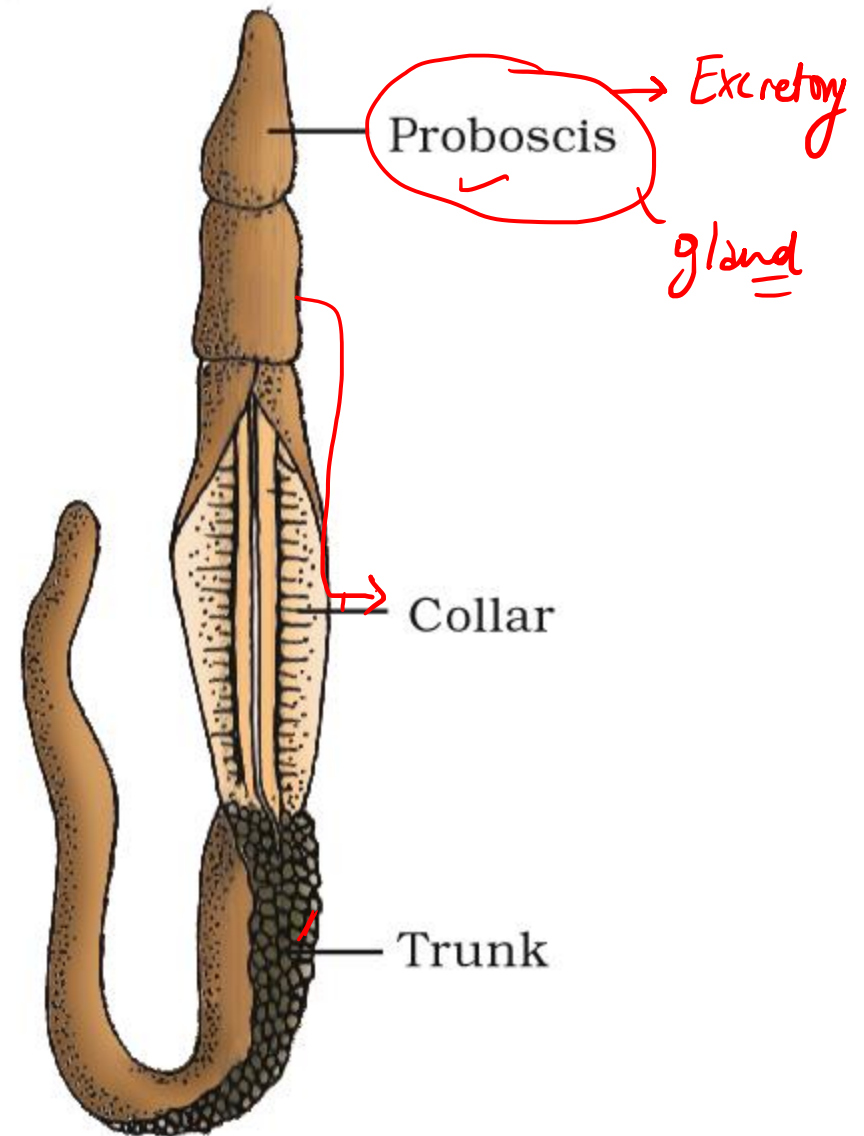
Animal Kingdom

Phylum – Hemichordata

Stomochord

- ☐ Earlier considered as a sub-phylum under phylum Chordata
- ☐ Small group of worm-like marine animals
- ☐ Organ -system level of organization
- ☐ Body Bilaterally symmetrical
- ☐ Triploblastic
- ☐ Coelomate
- ☐ Cylindrical ✓
- ☒ Divided into 3- proboscis; collar & trunk
- ☐ Circulatory system is of open type ✓
- ☐ Respiration takes place through gills ✓
- ☐ Excretory organ is proboscis gland
- ☐ Sexes are separate
- ☐ Fertilization is external. ✓
- ☐ Development is indirect. ✓

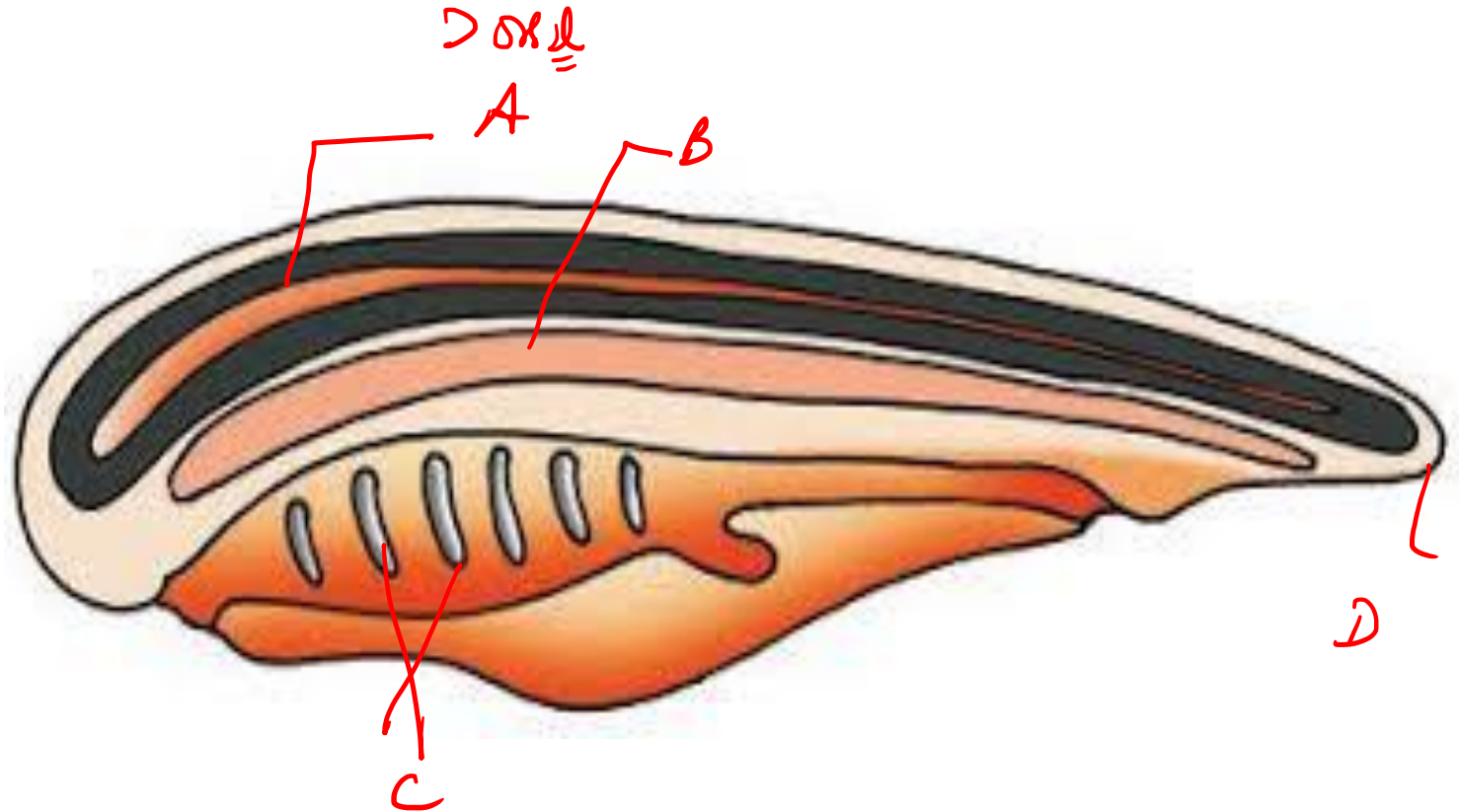
Eg: *Balanoglossus* and *Saccoglossus*



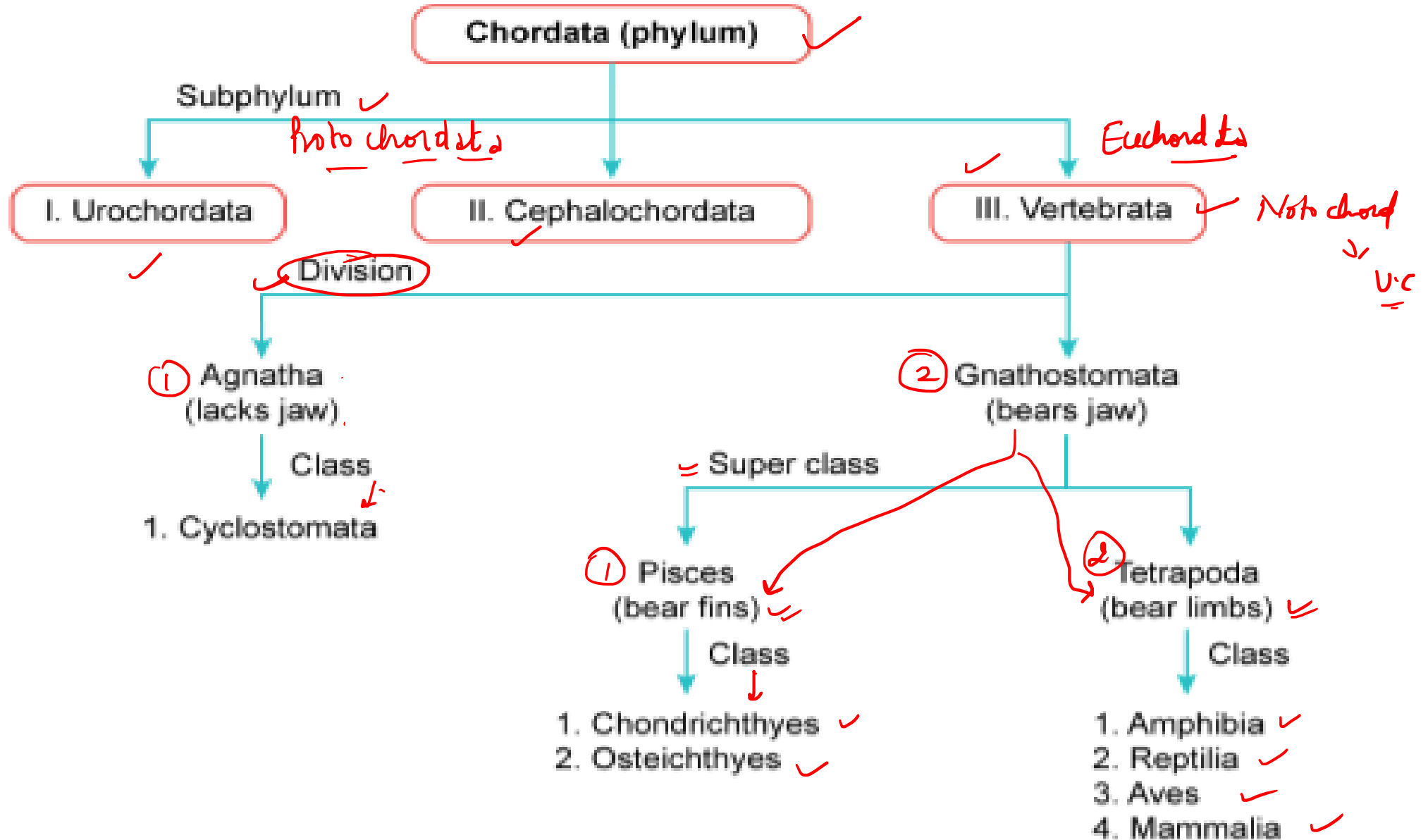
Animal Kingdom

Phylum – Chordata ✓

- ✓ ☒ Animals possessing notochord ✓
either through life or during early embryonic life. The notochord is stiff & flexible rod lying ventral to nerve
- ☐ Triploblastic ✓
- ☐ Coelomate ✓
- ☐ Bilaterally symmetrical ✓
- ✓ ☒ Post anal tail ✓
- ☐ Closed circulatory system
- ✓ ☒ Dorsal hollow nerve cord (single)
- ✓ ☒ Paired pharyngeal gill slits
- ✓ ☒ 3 sub phylum: -
 1. Urochordata or Tunicata ✓
 2. Cephalochordata ✓
 3. Vertebrata. ✓



Animal Kingdom



Animal Kingdom

1. Protochordata

- All have notochord but it does not from vertebrate column
- All marine

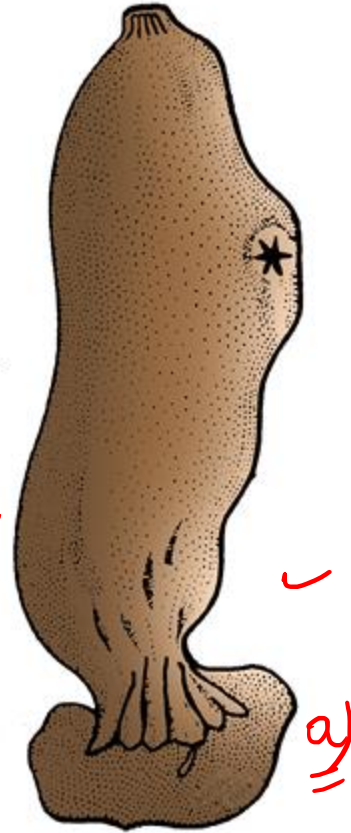
Urochordata / Acrania

- Notochord present in tail of larva
- E.g.: *Ascidia*, *Salpa*, *Doliolum*

Herdmania

Cephalochordata / Acrania

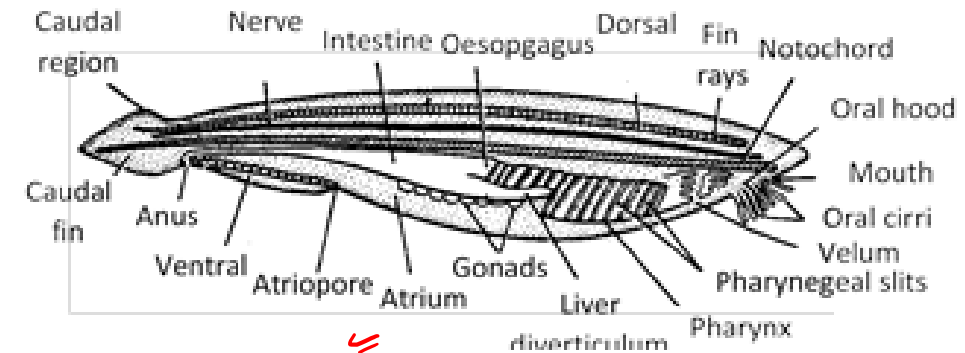
- Notochord present from head to tail region & throughout life
- E.g.: *Branchiostoma* – *Amphioxus*



Adult

Degenerate

a)



b)

Lancelet

Animal Kingdom

Vertebrata

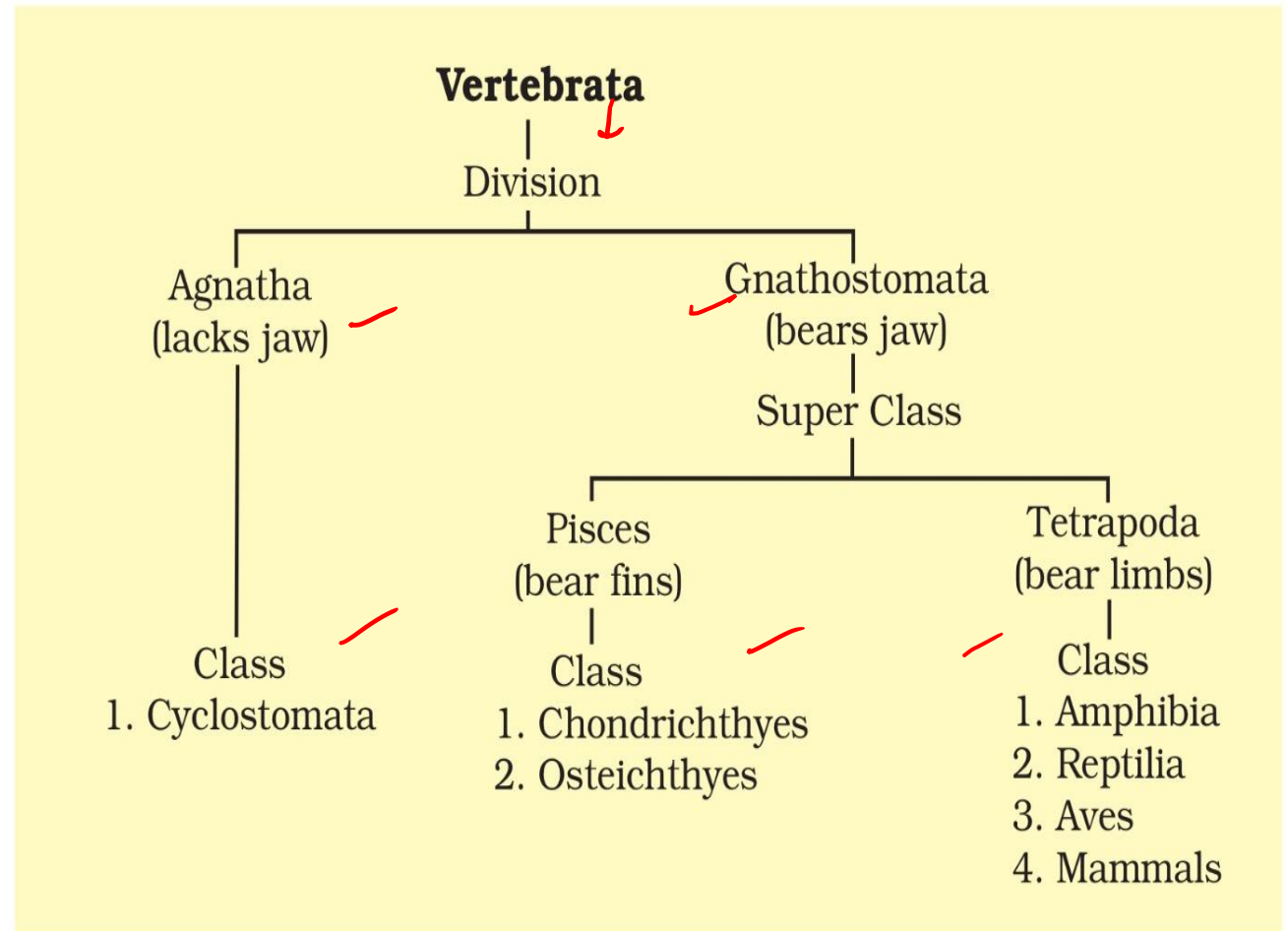
- Notochord present during embryonic period & replaced by vertebral column in adults
- Vertebral column have many vertebrae around notochord along with dorsal nerve cord
- ✓ □ Ventral muscular heart with 2/3/4 chamber ✓
- ✓ □ Kidneys – excretion & osmoregulation ✓
- ✓ □ 2 pairs of lateral appendages-fins / limbs ✓

Divided in 2 divisions based on presence or absence of jaw

□ **Agnatha** –jawless .

eg Class : Cyclostomata (lamprey)

□ **Gnathostomata** - Bear jaws – divided into 2 super classes i.e Pisces and Tetrapoda



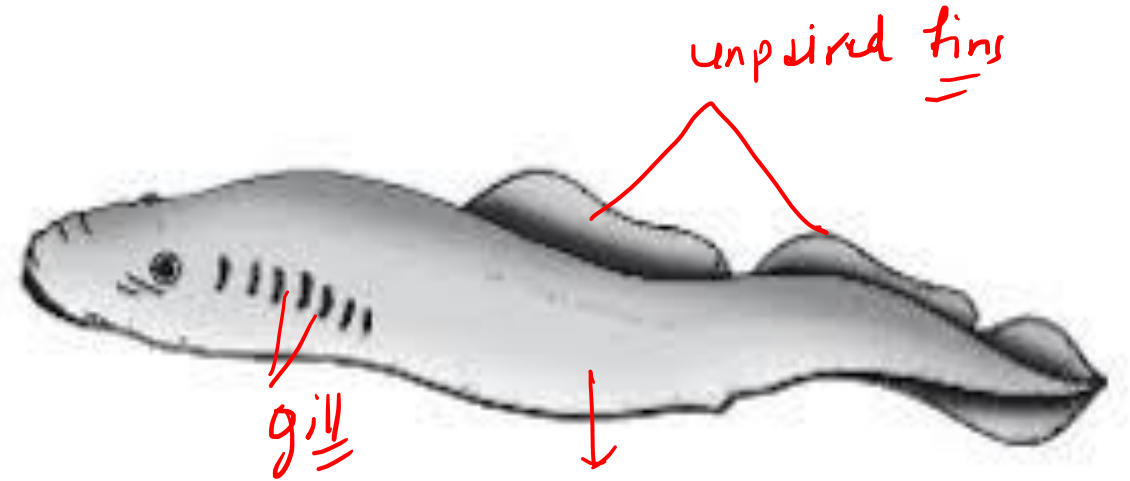
Animal Kingdom

Class – Cystostomata

Eg – Lamprey [petromyzon] & hagfish [myxine]

→ Bisexual

- ☐ Parasite on fishes ✓
- ☐ Elongated body have 6-14 pair of gill slits for respiration ¹⁵
- ☐ Sucking & circular mouth ✓
- ☐ No functional pineal eye ✓
- ☐ Single sex organ discharges gametes in coelomate ✓
- ☐ Cranium & vertebral column – cartilaginous ✓
- ☐ Persistent notochord ✓
- ☐ Heart surrounded by a cartilaginous capsule ✓
- ☐ Marine
- ☐ Migrate into river for spawning
- ☒ Ammocoete larva hatches out from eggs through metamorphosis that migrate into oceans



Adult → fresh → Ocean
ocean (b)

Animal Kingdom

Bony Fish	Cartilaginous Fish
Bones are present as skeleton.	Cartilages are present as skeleton.
Mouth is terminal or sub terminal in position.	Mouth is ventral in position.
Tail fin is homocercal.	Tail fin is heterocercal.
Operculum is present.	Operculum is absent.
E.g. <u>Labeo</u> , <u>Catla</u> , <u>Anabas</u> etc.	E.g. <u>Scoliodon</u> , <u>Torpedo</u> etc.

Air bladder



4 pairs

Oviparous

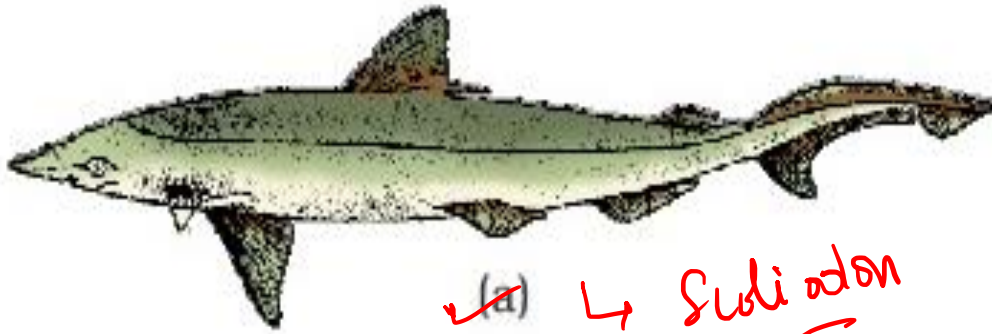
Exocoelous, Hippocampus, Pterophyllum, Betta.

(osy fish)
Pristis
(saw fish)

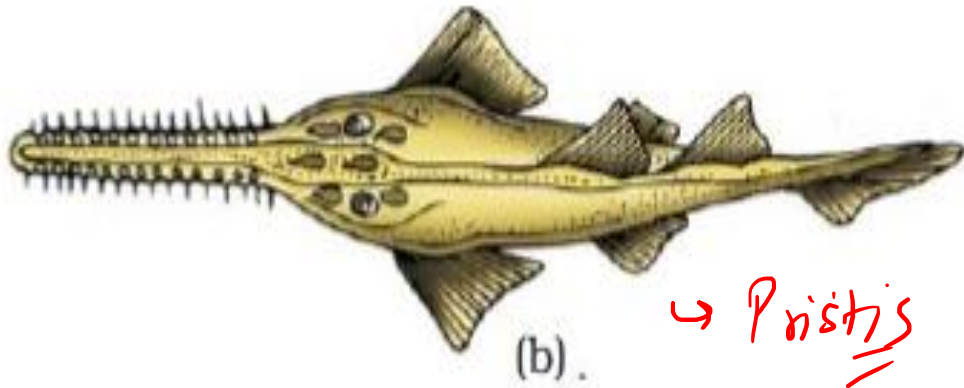
Electric ray

Viviparous
Tygon

Animal Kingdom



✓ (a) → Sudion



✓ (b) → Pristis



✓ (a)
Hippocampus



✓ (b)
Labeo

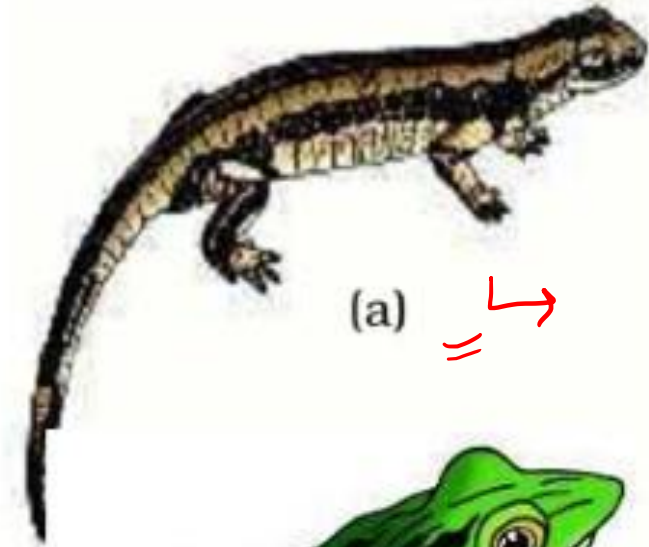
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Class – Amphibian ✓

- ☐ 2 phases in life cycle – adult & larvae
- ☐ Larva is aquatic & adult is terrestrial
- ☐ Require water for breeding & fertilization is external
- ☐ 2 pairs of limbs ✓
- ☐ Body divided into head & trunk ; no neck present, tail ✓
- ☐ Moist skin without scales ✓
- ☐ A tympanum replace the ear ✓
- ☐ Alimentary canal, urinary and reproductive tracts open into a common chamber called cloaca which opens to the exterior
- ☐ Heart – 3 chambered , 2 auricles & 1 ventricle
- ☐ Cool blooded ✓
- ☐ Two occipital condyle & 10 pair of cranial nerve
- ☒ Respiration in tadpoles- gills , adult – lungs & skin, some breath through gills in adult stage too
- ☐ Sexes separate ✓

Buto

Eg :- toad, Frog, Salamander, Limbless amphibian (Ichthyophis) ✓



(a) →



(b) →

Animal Kingdom

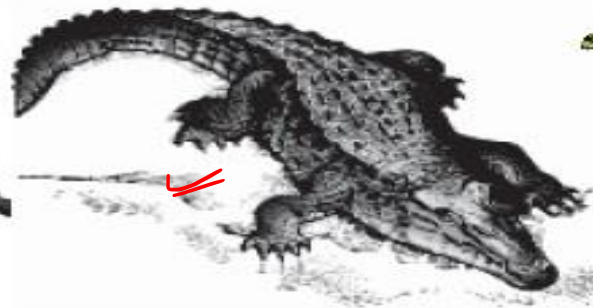
Class – Reptilia

- ☐ Crawling animals
- ☐ Body covered by dry, cornified skin that contain epidermal scales/ scutes
- ☐ Post anal tail present
- ☐ No external ear openings
- ☐ 2 pair of limbs with 5 digits in each
- ☐ Cold blooded
- ☐ They are 3 – chambered except crocodile
- ☐ Carnivorous
- ☐ Snakes & lizard shed their scales as skin cast → Ecdysis/ Moulting
- ☐ Internal fertilization

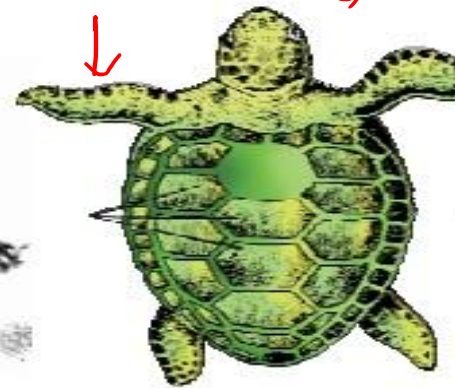
Eg :- turtle (Chelone), Lizard (Hemidactyles), Calotes, Varanus



(a)



(b)



(c)



(d)

→ Naja
→ Bungarus
Viper
→ Snake
Cobra

Animal Kingdom

Class- Aves

- ☐ Stream – lined body ✓
- ☐ Body has head, trunk, tail, a pair of limbs ✓
- ☒ Body covered with feather ✓
- ☐ Forelimbs convert into feather ✓
- ☐ Bones – hollow (pneumatic) ✓
- ☐ Warm blooded ✓
- ☐ 4 – chambered heart ✓
- ☐ No teeth in beak ✓
- ☐ Alimentary canal has crop & gizzard ✓
- ☐ Sharp eyesight ✓
- ☐ Oil gland at the base of tail → Preen ✓
- ☐ Oviparous ✓

Eg :- Crow, Parrot, Owl

Cory-
xus //



Unpygal



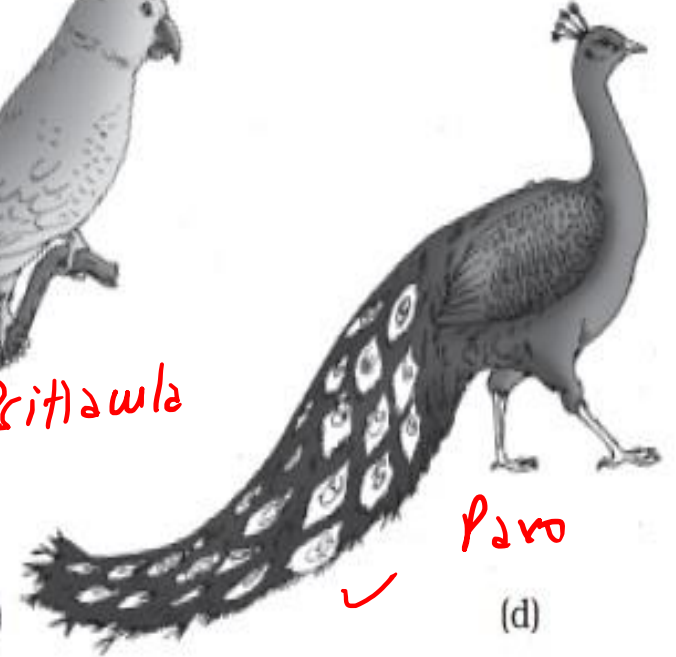
(b)

↳ ostrich
↓
Stuthio



(c)

Pritawla



(d)

Pavo

Neophron

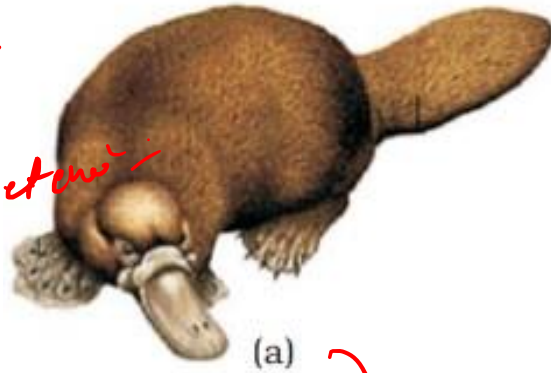
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Class – Mammalia ✓✓

- Found in a variety of habitats
- Milk producing mammary glands ✓
- Skin has hair ✓ ✓ 4 Aquatic mX
- External ear ✓ Pinna ✓✓
- Teeth are present ✓ Therodont, Heterodont ✓
- 4 – chambered heart ✓
- Diaphragm divided body cavity in upper – chest and lower – chest ✓✓

Viviparous → except Platyrrhini, Echinodonta

Eg :- Whale (*Balaenoptera*),
Monkey (*Macaca*), *Equus* (horse)



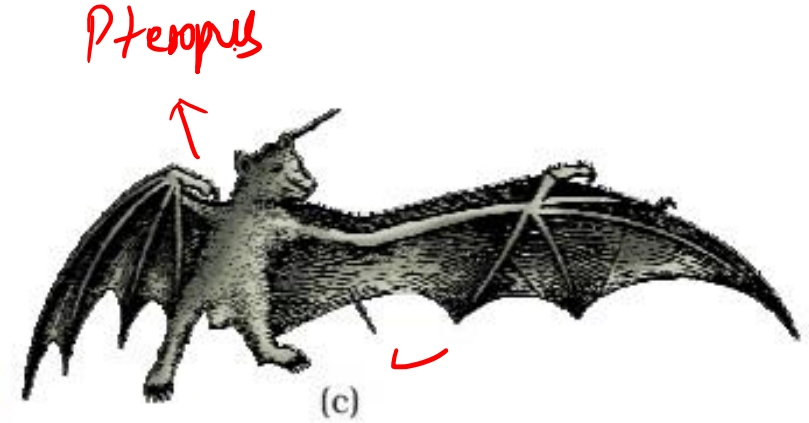
(a)

Ornithorhynchus



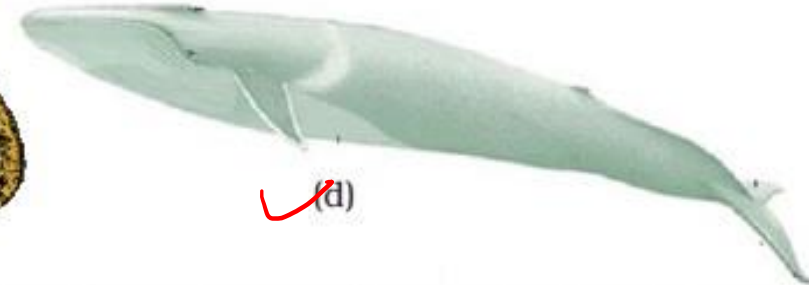
(b)

Macropus



(c)

Pteropus



(d)

Thank You