# Model Answer of AV-9014

## B.Sc.(R.T.) I Semester-2015-16

## R.T.-104: Diversity of Fauna-I

### Section-A

Q.1. Objective Type Questions:

(i) All (ii) Lamarck (iii) Polyps (iv) Myonemes
(v) Flame cells (vi) Monogenetic (vii) Annelids
(viii) 19 pairs (ix) Giardia (x) starfish

### Section-B

Q.2. Describe Modern system of Classification:

There are six kingdoms which includes all living species present in the Biosphere. Living beings are classified on the basis of following kingdom systems given by various scientists:

Kingdoms:

- Animalia → Study of animals
- Plantae → Study of plants
- Protista → Study of unicellular organisms
- Monera → Study of bacteria
- Fungi → Study of colourless & saprophytic organisms
- Archaebacteria → Study of primitive bacteria
- Eubacteria → Study of true bacteria.

① Two kingdom system of Classification:

This system of classification was given by Linnaeus.

(a) Animalia
(b) Plantae

② Three kingdom system of classification:

It was given by Haeckel (1866).

ⓐ Animalia
ⓑ Plantae
ⓒ Protista

③ Four kingdom system of classification:

This system of classification was given by Copeland (1956)

ⓐ Animalia
ⓑ Plantae
ⓒ Protista
ⓓ Monera

④ Five kingdom system of classification:

It was given by Whittaker (1961).

ⓐ Animalia
ⓑ Plantae
ⓒ Protista
ⓓ Monera
ⓔ Fungi

⑤ Six kingdom system of classification:

This is latest classification which is given by Woes et al (1990). They divided the kingdom Monera into two kingdoms ⓘ Archaebacteria ⓘⓘ Eubacteria

ⓐ Animalia
ⓑ Plantae
ⓒ Protista
ⓓ Fungi
ⓔ Archaebacteria
ⓕ Eubacteria

Q.3 Structure of Amoeba

Systematic Position → Phylum – Protozoa, Class – Rhizopoda, Genus → Amoeba

– Habits and Habitat → widely distributed, found in freshwater on bottom mud and aquatic vegetation, found in abundance in water containing bacteria & organic matter. Amoeba has great power of regeneration

– Culture of Amoeba → by "Hay infusion method"

– Structure →

① Shape and size → Unicellular, microscopic, 250 to 600 μ in diameter, irregular, colourless & translucent, anterior end has pseudopodia while post. end void (disappearing pseudopodia)

② Pseudopodia → Polypodial species, formed by liquefaction and flowing forward of the cytoplasm, they perform locomotion and food ingestion.

③ Plasma membrane → Thin, delicate, selectively permeable.

④ Cytoplasm → fluid, bounded by plasma membrane, contains several organelles, differentiated into two:

(a) Ectoplasm → Peripheral, thin (less amount), clear, transparent, forms hyaline cap at tip of pseudopodium

(b) Endoplasm → Surrounded by ectoplasm, granular fluid, semitransparent, forms bulk of the animal.

– Outer endoplasm is gel (thick) and inner is sol (thin)

⑤ Cytoplasmic organelles → present in endoplasm

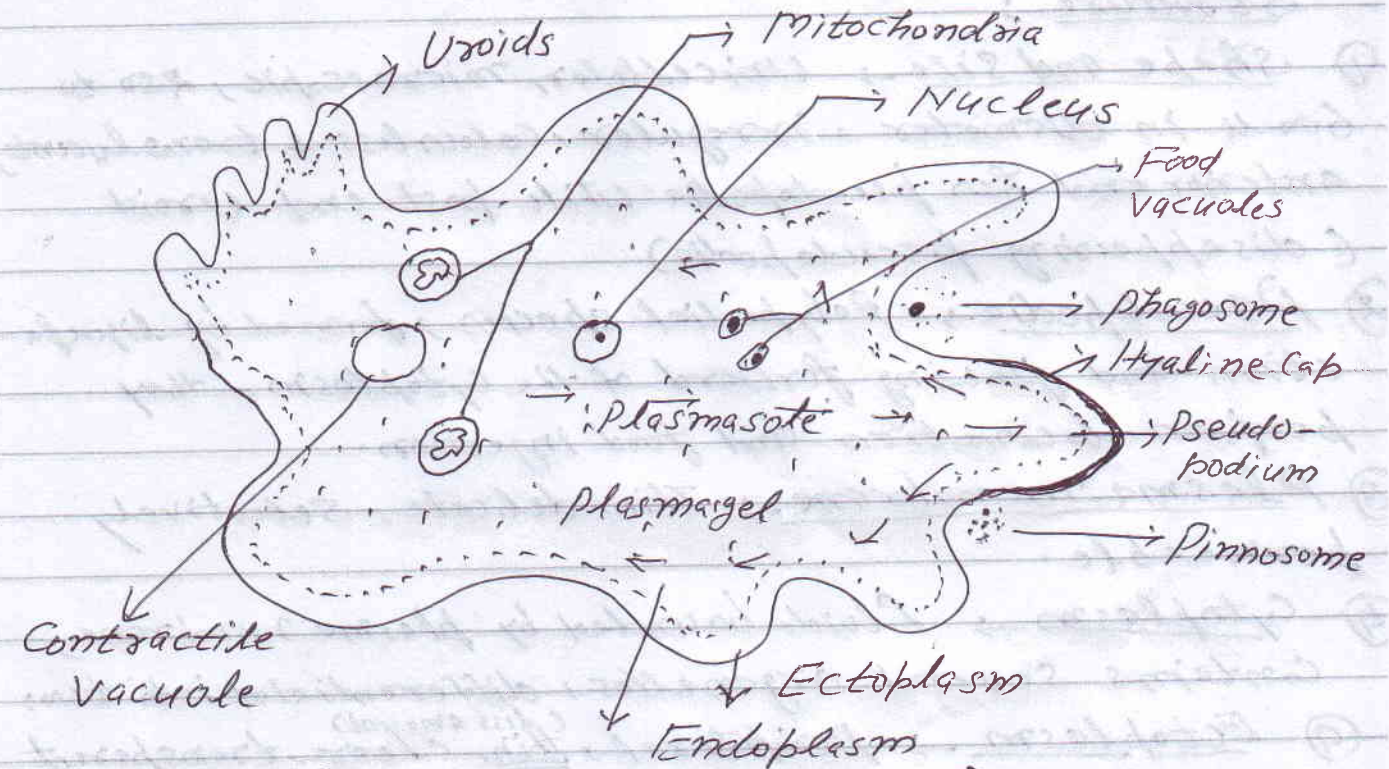
(a) Nucleus → Single, large, flat and discoidal, granular and refractive to light, bounded by nuclear memb., nucleoplasm contains chromatin granules & nucleoli.

(b) Contractile vacuole → At post. end, pulsatile, filled with watery fluid, surrounded by feeder vacuoles or mitochondria, helps in osmoregulation & excretion.

(c) Food vacuoles → Spherical, contain food materials where digestion takes place, ejected out with undigested food.

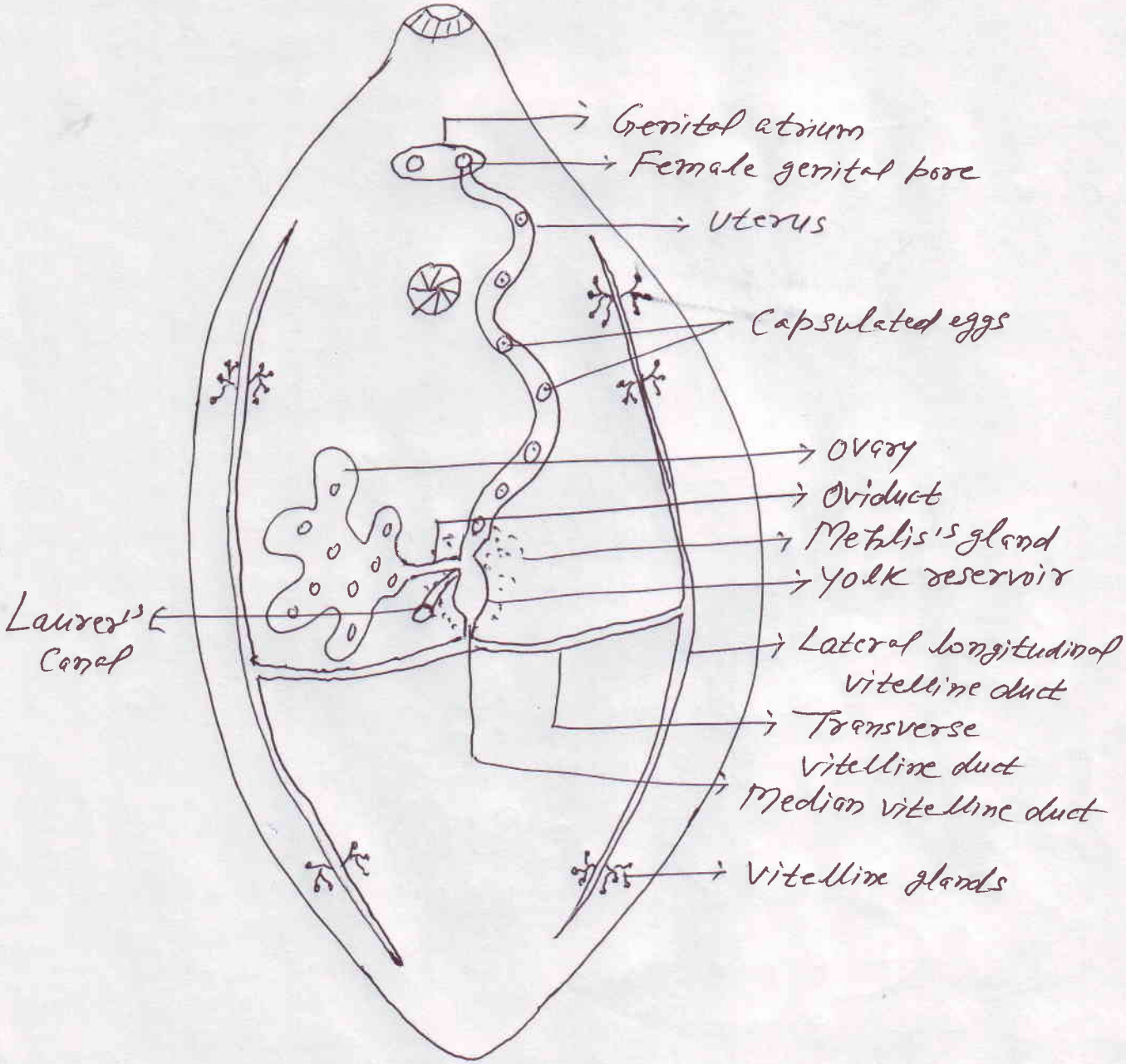
(d) Water globules → several, small, filled with watery & colourless fluid.

(e) Other organelles → Endoplasmic reticulum, ribosomes, Golgi bodies, mitochondria, lysosomes, microtubules, etc.




(Structure of Amoeba)

Q.4. Draw a labelled diagram of female reproductive system of Fasciola.



Q.5. I. Protozoan diseases

① Malaria →

- Causative agent → It is caused by Plasmodium which is a sporozoan. Most common species are P. vivax, P. falciparum, P. ovale and P. malariae.
- It causes malaria in humans and other animals
- Host → Primary host is man and secondary host is female anopheles mosquito. (Digenetic in nature).
- Mode of infection → When female anopheles bites the man then it releases sporozoites of Plasmodium into the blood which cause malaria.
- Symptoms → ① High fever and shivering ② Headache ③ Pain in joints ④ Vomitting ⑤ Anaemia

- Prevention, Control and Treatment :-

① Destruction of mosquitoes by using pesticides
② Destruction of breeding places
③ Use of mosquito net ④ Use of repellants
⑤ Use of anti-malaria drugs like Quinine.
⑥ Biological control by Gambusia fish, etc.

- In India "National Malaria Control Programme" started in 1962.

② Amoebic dysentary :-

- Causative agent :- It is caused by Entamoeba histolytica which is a rhizopod. It is an endoparasite of large intestine of man. Children and youngs are very susceptible to it.
- Host → It is monogenetic. The host of it is man.
- Mode of infection → It is transmitted to man by contaminated food and water. Cystic form of Entamoeba is ingested which cause infection.
- Symptoms → ① Ulcers in intestinal wall ② Blood and mucous in stool ③ Stomache & Enteritis ④ Abscess in liver, brain, lungs, etc.

- Prevention, Control and Treatment → (1) Proper sanitation (2) Purification of water (3) Washing of fruits & vegetable with potassium permanganate before use. (4) Use of drugs like Emetine, Metronidazole, Terramycin, Erythromycin, etc.

(3) African Sleeping Sickness →

- Causative agent → It is caused by Trypanosoma gambiens which is a flagellate. It lives in blood & lymph glands.
- Host → It is digenetic. Primary host is man and secondary host is Tse-Tse fly (Glossina)
- Mode of infection → It is transmitted to the man by the bite of Tse-Tse fly. Saliva contains metacyclic form which is injected into the blood.

Symptoms → (1) It causes local irritation (2) Irregular recurrent fever (3) Loss of weight (4) Anaemia (5) Severe headache (6) Sleeplessness and then death following coma.

- Prevention, Control and treatment →

(1) Eradication of bushes (2) Spray of insecticides (3) Injection of Suramin (may be controlled in initial stage). (4) Personal defense from Tse-Tse fly.

(4) Leishmaniasis →

- Causative agent → It is caused by Leishmania donovani which is a flagellate. It is intracellular parasite of WBCs, liver and spleen.
- Host → It is digenetic. Primary host is man and secondary host is sand fly (Phlebotomus).
- Mode of infection → It is transmitted to the man by the bite of sand fly.
- Symptoms → (1) High fever (2) Anaemia (3) Darkening of skin (4) Swelling (5) Enlargement of spleen and liver
- Prevention, Control and Treatment →

(1) Eradication of bushes (2) Periodic spray of insecticides (3) Killing of reservoir hosts (dogs) (4) Personal defense

(5) Use of drugs like Sodium-antimony tartrate, Urea stibamine, Pentamidine isethionate, etc.

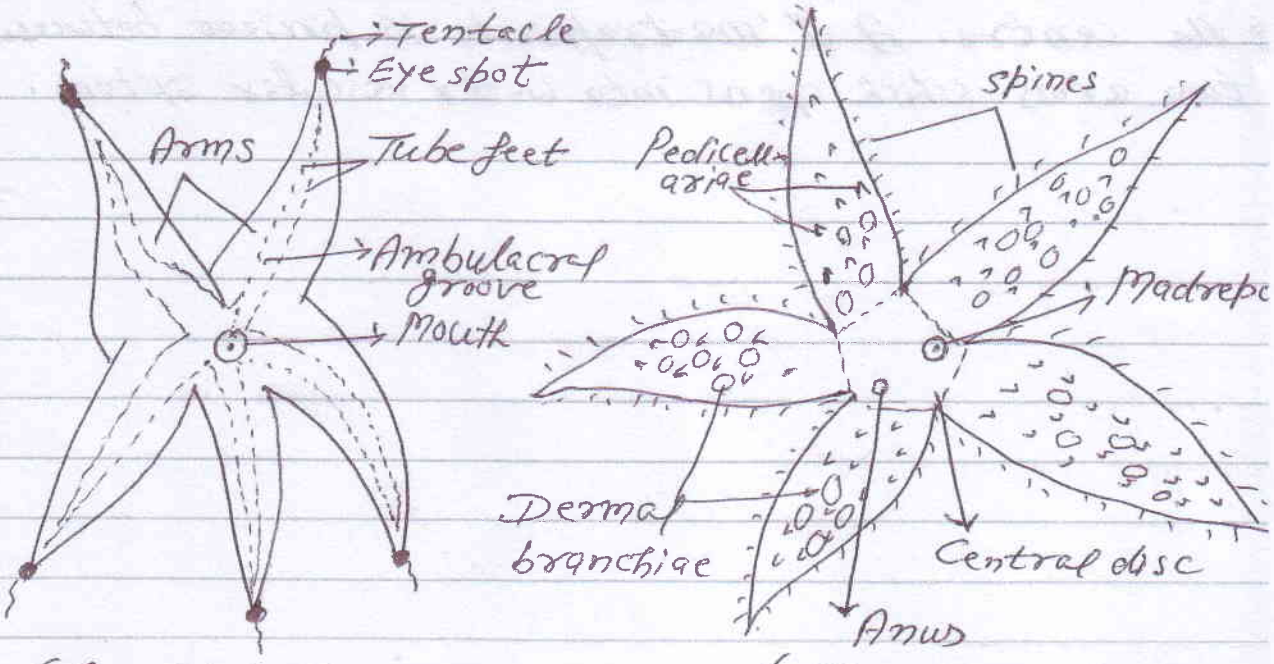
(5) Diarrhoea →

- Causative agent → It is caused by Giardia intestinalis which is a flagellate parasite. It lives in small intestine
- Host → It is a monogenetic. The host is man
- Mode of infection → It is transmitted to man through Contaminated food and Water Containing cysts. Its infection is more in children.
- Symptoms → (1) Loss of appetite (2) Headache (3) Enteritis (4) Loose motions
- Prevention, Control and Treatment →

(1) Proper sanitation (2) Use of washed fruits & vegetables (3) Use of purified water (4) Use of drugs like Atebrin, Chloroquin, Camoquin, etc.

Q. 6. Structure of Starfish (9)

Classification → Phylum → Echinodermata
Class → Asteroidea, Genus → Asterias




- Habits and Habitat :- These are exclusively mari
- These freely move on bottom by arms/Tube fe
- These are carnivorous in nature.
- They show autotomy & have power of regenera
- They have pentamerous radial symmetry.
- Shape and Size and Colour :- It is star shaped and yello pink, orange, brown or purple in colour.
- Body Surface → Body is flat and has dist oral and aboral surfaces.

(1) Oral Surface → It is directed to the substra Central disc bears mouth. From each angle of m an ambulacral groove arises which contains spin and tube feet which perform locomotion, respira and capturing of food.

- Tip of each arm bears a tentacle which is tou and smell receptor.
- At the base of tentacle, there is a bright red pho receptor eye spot.

(2) Aboral surface → It is slightly convex do surface. It contains spines, pedicellariae (for

cleaning or protecting the body surface) and dermal branchiae (for respiration). Anus is situated close to the centre. A madreporite is present between two arms which opens into water vascular system.

Q.7. Structure of Balanoglossus

- Classification: Phylum → Hemichordata
Class → Enteropneusta, Genus → Balanoglossus
(Acorn or Tongue worm)

- Habits and Habitat → It is marine and lives in 'U' shaped burrow in shallow water. It is moved by cilia. It feeds on sand or mud containing organic matter and micro-organisms. These are unisexual and live in separate tube. Regeneration is present.

- Structure → It consists of following organs:

① Shape and size → Body is worm like. It is 10 → 50 cm long. Body is without exoskeleton and appendages.

② Colouration → Body colour is bright reddish or orange

③ Division of the body → Body is unsegmented but can be divisible into three segments:

(i) Proboscis → It is anterior most, short and conical. It bears Buccal diverticulum. It is attached to the collar by proboscis stalk or neck.

(ii) Collar → It is middle, short and cylindrical. Anterior end covers proboscis stalk

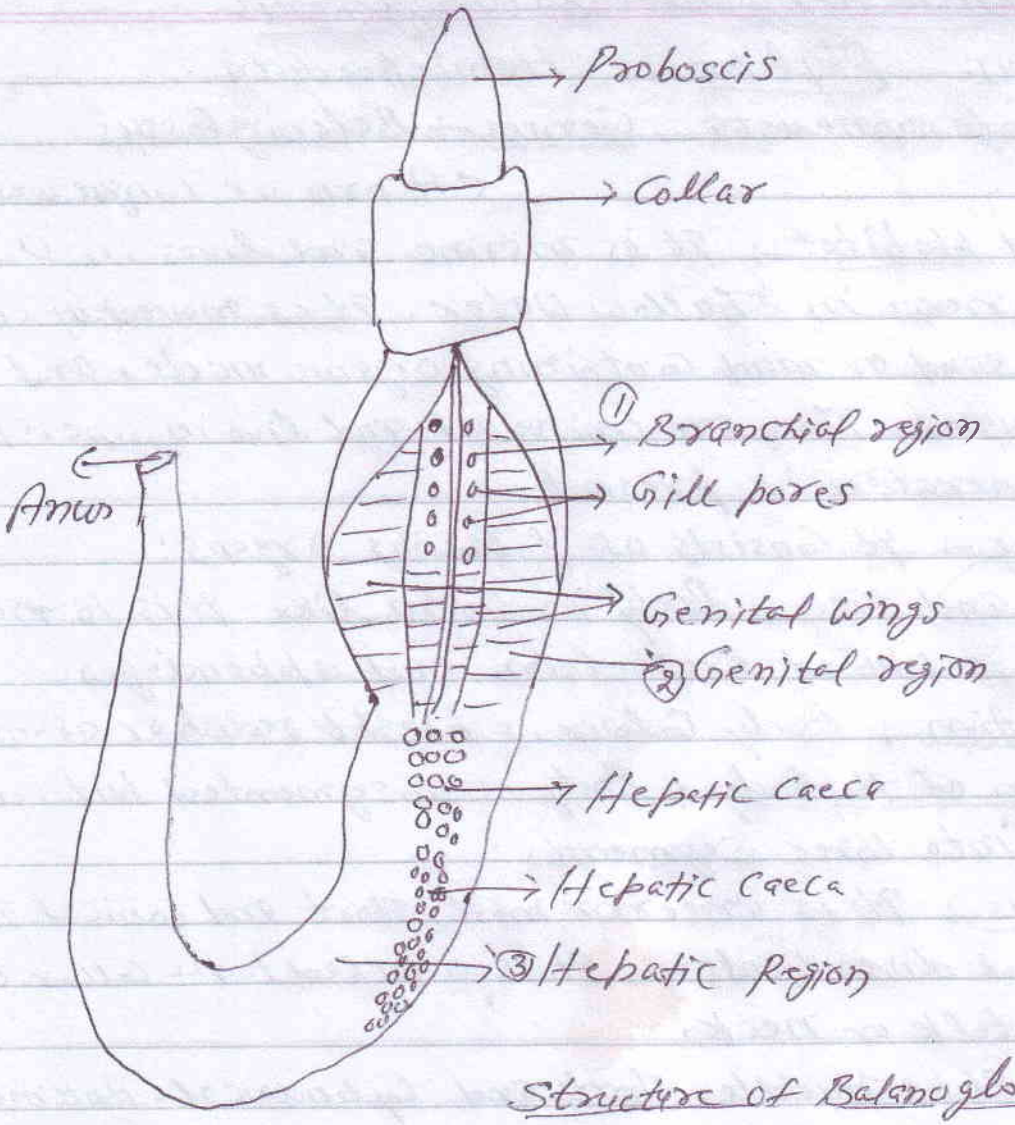
(iii) Trunk → It is largest posterior part. It is annulated. It is differentiated into three regions.

(i) Branchial region → It bears two longitudinal rows of gill pores for respiration.

(ii) Genital region → It is characterised by genital wings containing gonads which produce gametes.

- Both regions combinely known as Branchio-genital region

(iii) Hepatic region → It bears hepatic caeca. Posterior part of hepatic region or caudal region bears terminal region.




Structure of Balanoglossus

## Section - C

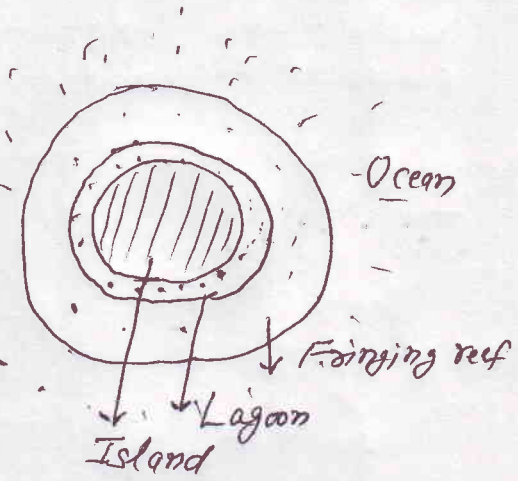
### Long Answer type Questions:

**Q. 8. Describe Corals and Coral reefs and also write their economic importance.**

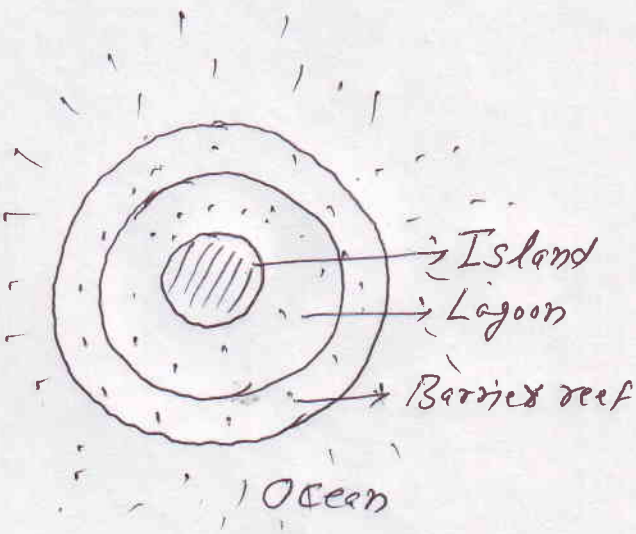
- Coral animals are marine, mostly colonial & polypoid Coelenterates which secrete calcareous skeleton known as Corals. Skeleton of solitary Coral is known as Corallite which fused together to form Corallum.
- Coral animals mainly belong to class Anthozoa and a few to the class Hydrozoa.
- Coral reefs: Coral colonies grow continuously and often form extensive masses known as Coral reef.

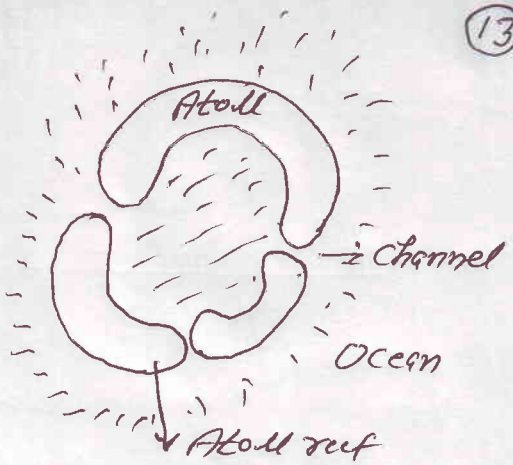
Kinds of Coral reefs: These are three types based on

① Fringing Reef → Coral reef is lying close to the volcanic island. It may lies about a quarter mile away from the shore. Width of lagoon is about 50–100 m. It is composed of Coral sand, mud, dead and living Coral colonies and other animals.




② Barrier Reef: It is like fringing reef but is located some distance away from the shore. The width of lagoon may be half a mile to 10 miles. The longest barrier reef is situated in Australia which is about 2500 km long.






(3) Atoll → It is ring like or horse-shoe shaped reef which encircles a lagoon but not an island. The lagoon varies from a few to about 90 km. across. It is generally broken by a number of channels. eg. Atoll of Bikini. It is famous for atomic and hydrogen bomb tests site.

- Economic importance of Coral reefs:

(1) These are favourable sites for the accumulation of petroleum deposits hence important for oil industry.
(2) Corals are used in curio trades.
(3) These serve as habitats for many plants & animals.
(4) Some are highly priced for their decorative value.
(5) Corallum rubrum is a precious stone and treated as auspicious in China & India.
(6) Few are used in some indigenous medicines in S. India.
(7) These are used as building material.
(8) These are used in the preparation of lime & cement.
(9) These are used as natural barriers against sea erosion & cyclonic storms.
(10) Reef fish varieties are more colourful than others.

Q. 9. Write general characters of phylum Platyhelminthes and classify it.

General characters: - These are generally free living & parasitic forms.
- Triploblastic - Organ level body organisation
- Unsegmented except cestoda & dorso-ventrally flattened
- Acoelomates - Hooks, spines & suckers are present
- Alimentary canal is incomplete - Respiratory & circulatory systems are absent - Excretion by lateral canals & flame cells - Nervous system is primitive - Sense organs are simple - These are hermaphrodite - fertilisation is internal and generally cross - Development is generally indirect - In life cycle, many larvae and hosts are present.
- Classification: It is divided into 03 classes:

Class-I Turbellaria: - Usually non-parasitic & free livings. - Commonly called as planarians. - Body unsegmented and flattened - Epidermis contains Rhabdites - Suckers absent - Hermaphrodites - Asexual & sexual reproduction present - Development usually direct eg. Dugesia, Bipalium.

Class-II Trematoda: These are parasitic forms - Commonly known as flukes - Body is leaf like - Suckers and hooks are present - Alimentary canal is incomplete - Generally hermaphrodite - Development indirect with many larvae and hosts: eg. Fasciola, Schistosoma

Class-III Cestoda: - These are endoparasites - Commonly known as tapeworms - Body is segmented & ribbon like - Scolex with suckers - Alimentary canal & sense organs absent - Mature proglottids are monoecious - Life cycle with one or more intermediate hosts.

eg. Taenia, Echinococcus

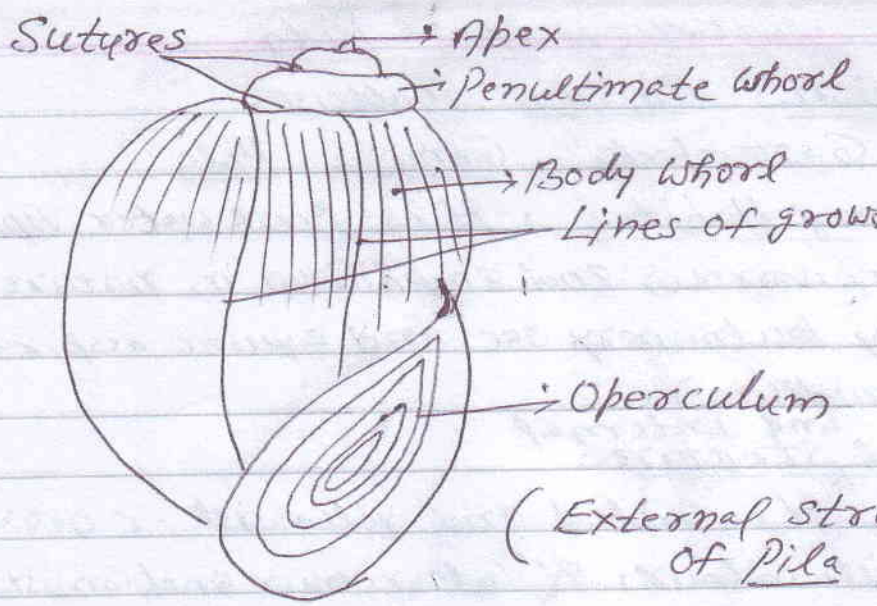
Q. 10. Structure of Pila

Classification → Phylum → Mollusca
Class → Gastropoda, Genus → Pila

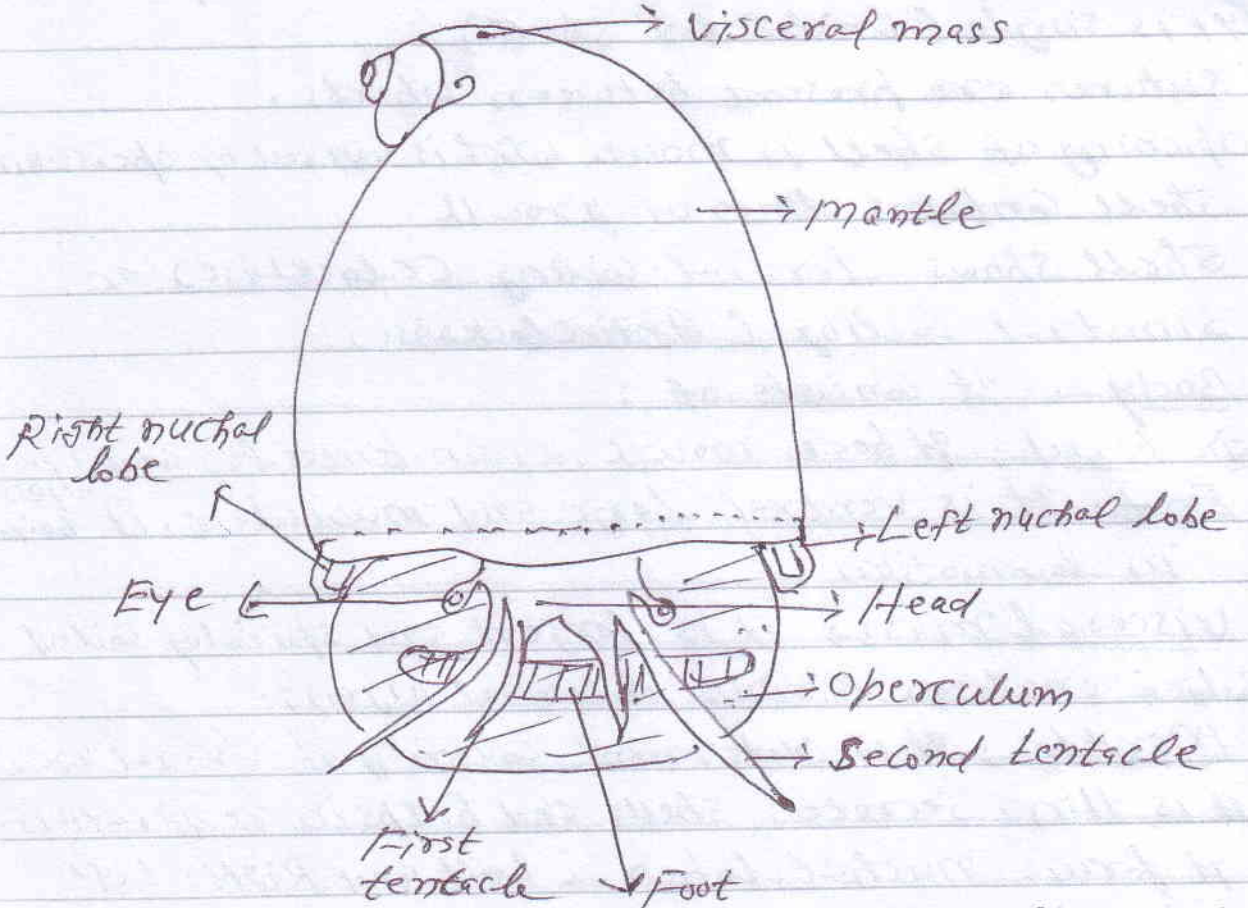
- Habits and Habitat → It is fresh water Apple sn
- It is herbivorous and amphibious in nature (Pulm respiration by pulmonary sac and aquatic respiration b gill / ctenidium).
- External and Internal structure:

① Shell → It is coiled and yellowish or brownish blackish in colour. It is calcareous and consists of Wh
- Apex → smallest and oldest
- Penultimate whorl → Just after apex
- Body whorl → It is largest and encloses body.
- It is single (Unilocular shell)
- Sutures are present between whorls.
- Opening of shell is mouth which is covered by opercu
- Shell contains lines of growth
- Shell shows dextral coiling (Clockwise) or Sinistral coiling (Anti-clockwise)

② Body → It consists of:
ⓐ Head → It bears mouth, 2 pair tentacles and 1 p
ⓑ Foot → It is ventral, large and muscular. It he in locomotion
ⓒ Visceral mass → It is largest and spirally coiled which encloses various internal organs.
ⓓ Mantle → It is outermost covering of visceral ma It is thin, secretes shells and helps in respiration
- It forms nuchal lobes → Left and Right. Left nuchal lobes forms respiratory siphon for aerial respiration when Pila is inside water.
ⓔ Mantle cavity → It is enclosed by mantle. Epitaenia divides mantle cavity into right branchial chamber containing gill and left pulmo chamber containing pulmonary sac & osphradium osphradium checks the water quality (Chemorecept




(External structure (shell) of Pila)

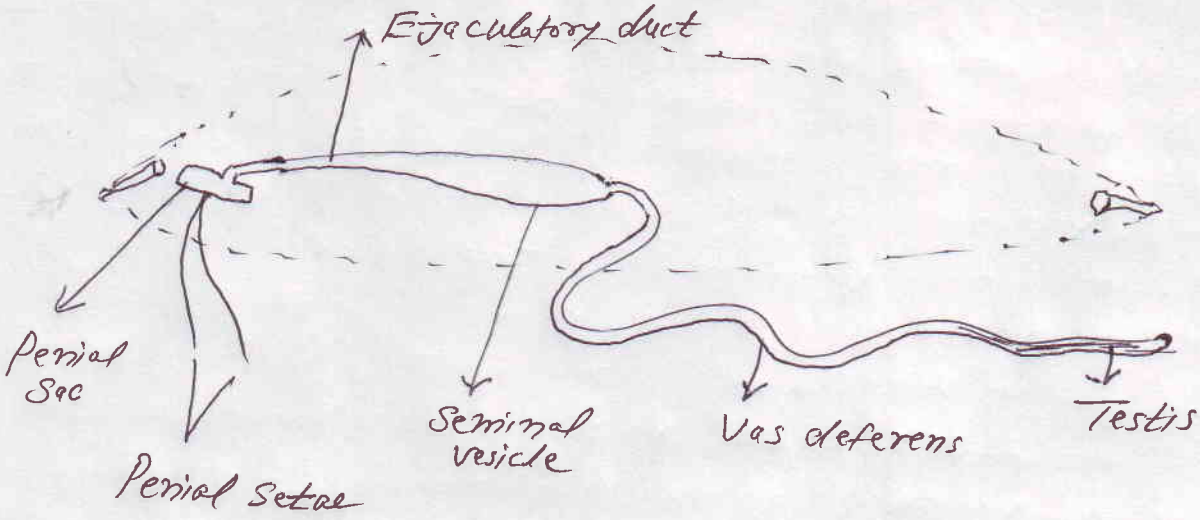



Internal structure of Pila (Visceral mass & Mantle)

Q.11. Describe reproductive system of Ascaris.

- Ascaris is unisexual and sexual dimorphism is present.

(A) Male Reproductive system:




- It is confined to posterior end, having following organs:

① Testis → It is single (monorchic), long, thread like and highly twisted. It produces sperms by the process of spermatogenesis. sperms are amoeboid.

② Vas deferens → It is short, thick and twisted tube like structure which conducts the sperms to seminal vesicle.

③ Seminal Vesicle → It is much thicker and wider sac like structure. It is highly muscular. It stores the sperms. Seminal fluid provide the nutrition to the sperms and also activates them.

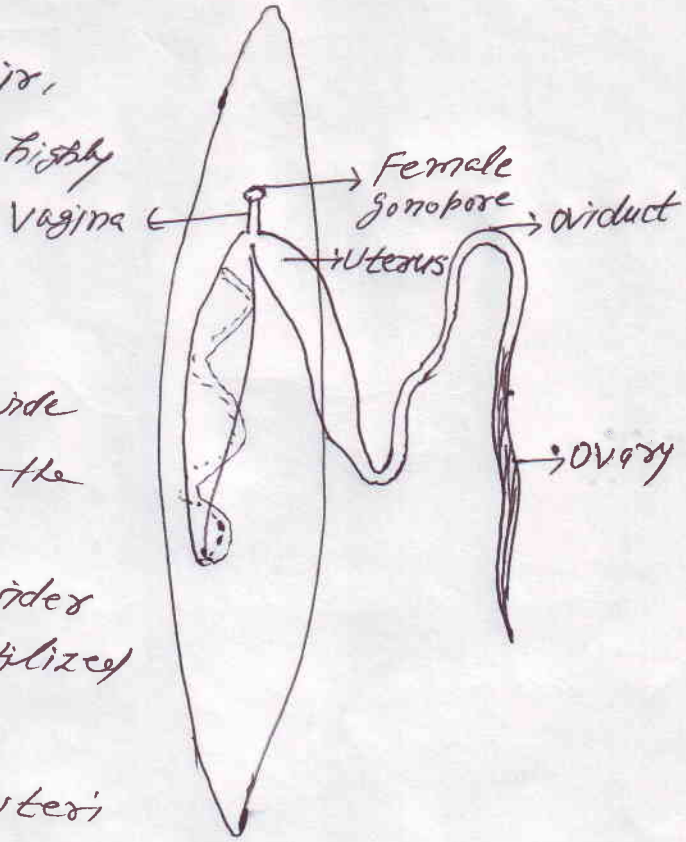
④ Ejaculatory duct: It is also tube like structure which conducts the sperms to Penial sac. It also contains a number of prostatic glands whose secretion helps in copulation.

⑤ Penial Sac → These are one pair and store sperms.

⑥ Penial Setae → These are two in number, each arises from a separate penial sac. These help in the transfer of sperms into vagina of female.

## (B) Female Reproductive system:

- It is didelphic in nature (paired) and lie in the posterior region.




(1) Ovaries → These are one pair, long & thread like. These are highly twisted & blind. These produce ova by the process of oogenesis.

(2) Oviducts: These are thick, wide and twisted, which conduct the ova.

(3) Uteri → These are much wider and thicker which store fertilized eggs.

(4) Vagina & Gonopore: Two uteri unite to form a muscular vagina which opens outside through female gonopore.