BIOLOGY

CLASS NOTES FOR CBSE

Chapter 04. Animal Kingdom

01. Basis of Classification

Level of body organization :

Protoplasmic level	→	In protozoans, acellular body performs all biological activities.
↓		
Cellular level	→	In sponges, cells are arranged as loose call aggregates and division of labour occurs among cells (Tissues absent).
↓		
Tissue level	→	In coelenterates and ctenophores, cells performing the same function are arranged into tissues.
↓		
Organ level	→	In platyhelminthes and other higher phyla tissues are grouped together to form organs.
↓		
Organ system level	→	In higher animals, organs further organise to form organ systems e.g. Aschelminthes, Annelida, Arthropoda, Mollusca, Echinodermata and Chordata.

Symmetry:

1) **Asymmetry :-** When any plane that passes through the centre does not divide the body of animals into two equal halves.
   e.g. : most of sponges are asymmetric.
2) **Radial symmetry :** When any plane passing through the central axis of the body divide the animal into two identical halves.
   e.g. : Coelenterates, ctenophores and echinoderms (adult)
3) **Billateral symmetry :** When the body can be divided into identical left & right halves in only one plane.
   e.g. : Platyhelminthes to chordates.

Germinal layers :-

(a) Diploblastic : Animals in which the cells are arranged in two embryonic layers ectoderm and endo-derm with an interveining undifferentiated mesoglea e.g. Sponges, Coelenterates and Ctenophores.

(b) Triploblastic : Those animals in which the developing embryo has a third germinal layers Mesoderm in between the ectoderm and endoderm e.g. Platyhelminthes to chordates.

Body Cavity or Coelom :

Presence or absence of a cavity between the body wall and gut wall is very important in classification.

(a) Acoelomates : Animals in which the body cavity is absent
e.g. Platyhelminthes

(b) **Pseudocoelomates :** Animals in which body cavity is not lined by mesoderm, instead, the mesoderm is present as scattered pouches in between the ectoderm and endoderm. Such a body cavity is called pseudocoelom.
e.g. Aschelminthes.

(c) Coelomates : Animals possessing coelom i.e. the body cavity which is lined by mesoderm on all sides
On the basis of embyonic development, the coelom is of two types.

(i) Schizocoel : Coelom formed by splitting of a mesodermal mass
e.g. Annelida, Arthropoda, Mollusca.

(ii) **Enterocoel :** Coelom formed by fusion of gut pouches during embryonic stage
e.g. Echinodermata, Hemichordata and Chordata.

Body plan :

(a) Cell-aggregate type : e.g. Sponges

(b) Bling Sac type : Animals in which digestive system in incomplete, it has only single opening to the outside of the body that serves as both mouth and anus.
e.g. Coelenterates to Platyhelminthes

(c) Tube-within-tube type : Found in those animals having complete digestive tract i.e. with separate openings mouth and anus.
e.g. Nemathelminthes to chordates

Segmentation :

(a) Pseudometameric : e.g. Tapeworms

(b) **Metameric :** In Annelids, arthropods and chordates.
In these animals, the body is externally and internally divided into segments with a serial repetition of atleast some organs, this is called metameric segmentation and the phenomenon is known as Metamerism.

Notochord :

It is a mesodermally derived rod-like structure formed on the dorsal side during embryonic development in some animals.

(a) Non-chordates : Animals without notochord e.g. Porifera to hemichordata

(b) Chordates : Animals with notochord.

Circulatory system :

(a) Open type : In which the blood remain filled in tissue spaces due to absence of blood capillaries. e.g. Arthropods, Molluscs, Echinoderms, Hemichordates and some lower chordates like tunicates.

(b) Closed type : In which the blood is circulated through a series of vessels of verying diamters i.e. arteries, veins and blood capillaries
e.g.Annelids, Cephalopod molluscs, Vertabrates etc.

Embryonic development :

On the basis of fate of blastopore, animals can be divided into two categories :

(a) Protostomiates : Animals in which mouths is formed first (Blastopore → Mouth)
e.g. Platyhelminthes to Mollusca

(b) Deuterostomiate : Animals in which anus is formed earlier than mouth (Blastopore → Anus)
e.g. Echinoderms, Hemichordates and Chordates.