**E Content for student of Patliputra University, Patna**

**B.Sc. Part II Paper –IV**

**Subject**:- Zoology Hons.

**Topic**:- Describe the development of amphioxus up to the formation of coelom

AND

Give a general account of aortic arches invertebrates

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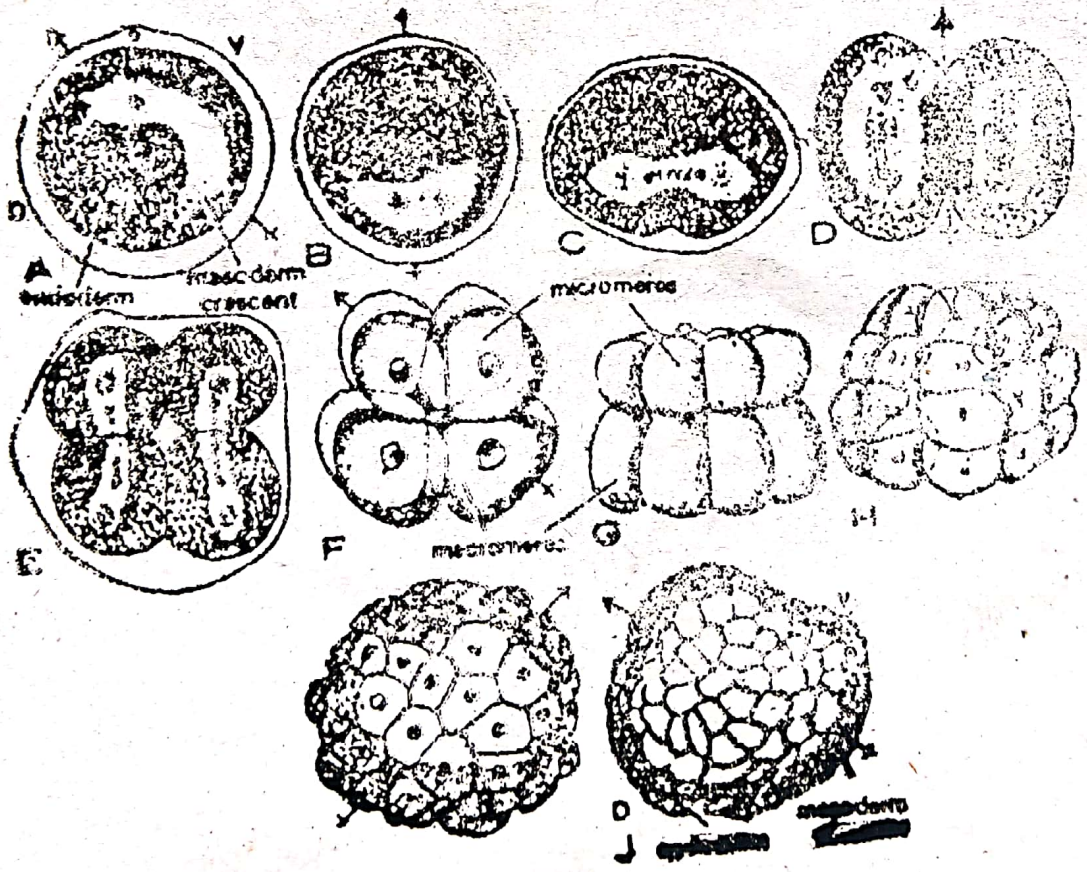
**Q. 12. Describe the development of amphioxus up to the formation of coelom.**

**Ans.** Development of amphioxus is shightly of typical tyre in the sense that the cytoplasmic area found to give rise to definite organs. This tube of development is also known as determinate type or mosaic type.

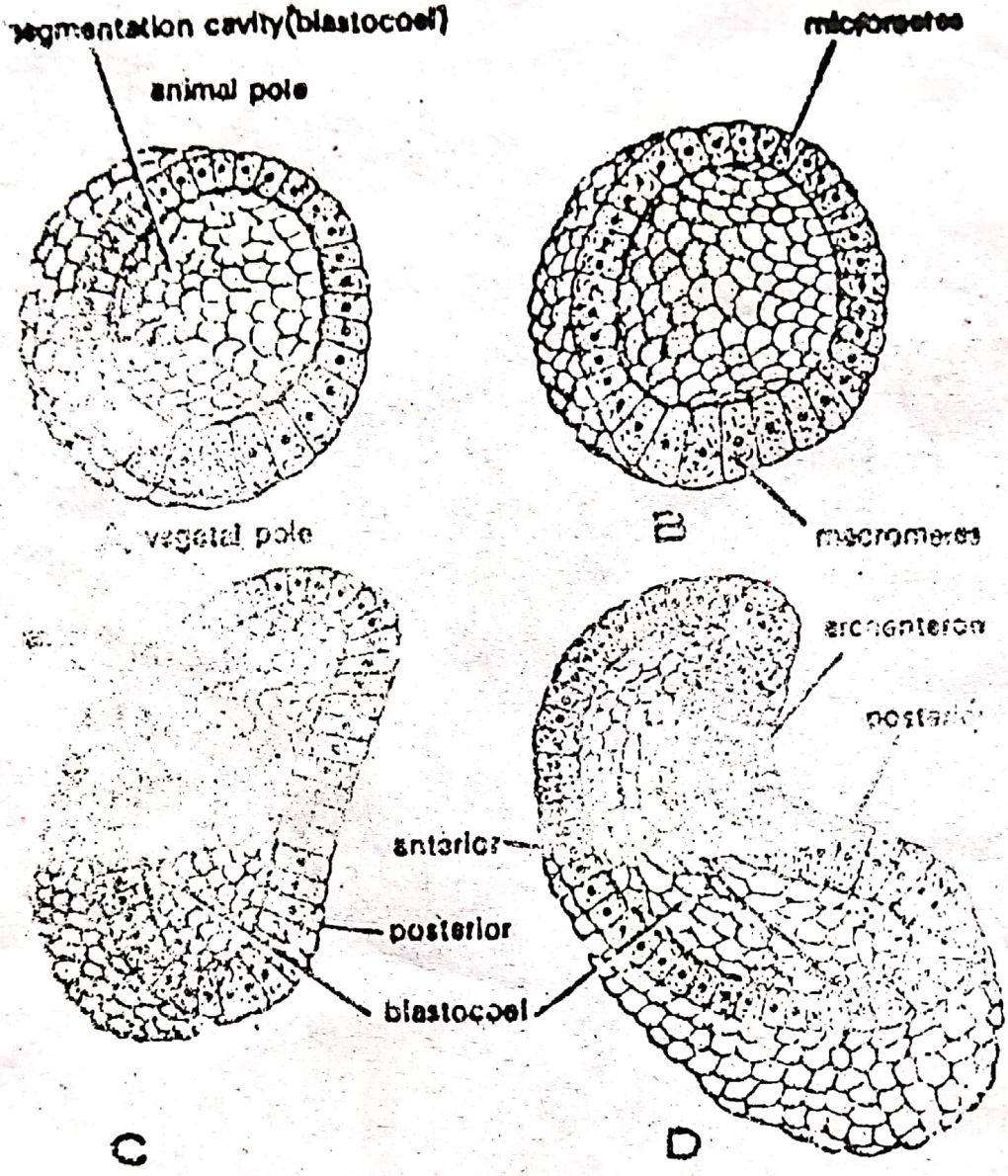
**Clevage and Blastulation—** The cleavage is holoblastic mequal. The first set of cleavage is meridional which cuts throught the egg along its mediun axis, starting at the postero-ventral side of egg. The second set of cleavage is again meridional, but at the right angle to the first. The third division is horizontal but slightly above the equatorial line. The third division divises the blastomeres into upper small micromere calls and lower large macromere cells. Now micromere and macromere cells divide irregularly giving rise to a multicellular embryo called as morulla.

Morulla may possess 64-128 cells. As a result of cleavage a small cavity is produced which is known as blatocoel and now the embryo is




termed as blastula. Blastulla has a single layer of outer columnal cells which give to ectoderm, a plate of large flattened cells which forms the endoderm and posterolateral granbular cells form the mesoderm.

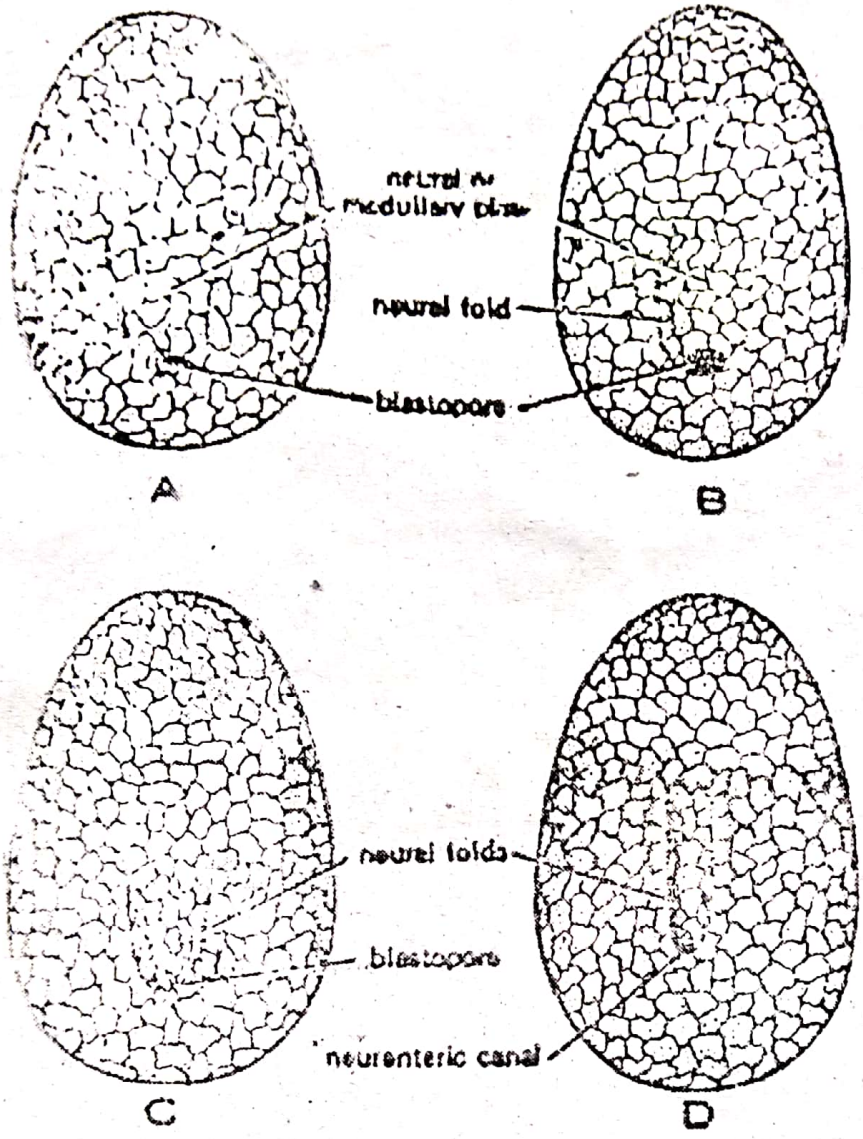
**Gastrulation**— As a result of rapid divisions of cells in micromere an invagination towards the vegetal pole takes place. The invagination obliterates the blastocoel and form another cavity, the archenteron. The




large opening of the archenteron is formed as blastopore which gives rise to future anus. The tapid spreading of micromere cells helps in invagination also and thus the gastrulation in amphi oxus, takes plae by epidoby as well as emboly.

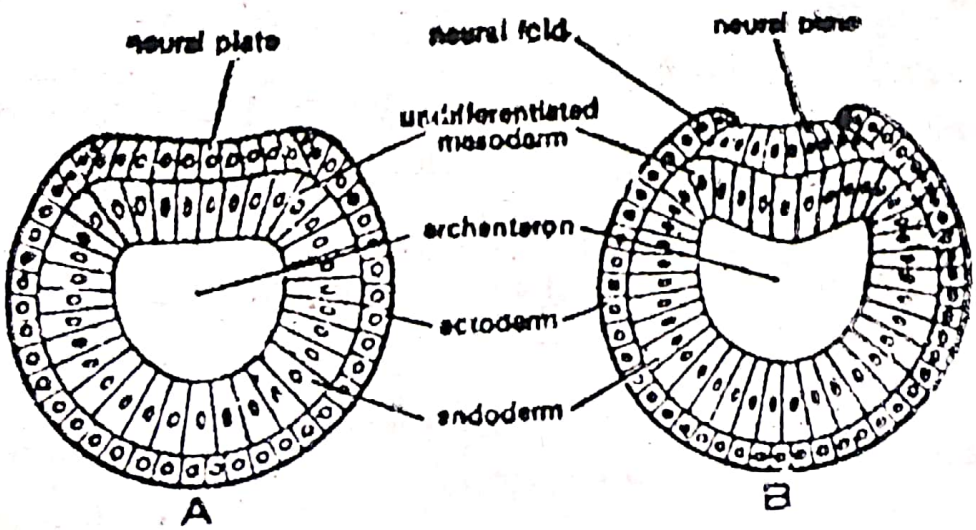
As a result of a rapid growth of micromeres the embryo also elongates. The endo lermal plate forms the leter ventral wall of the archenteron while the megodermal cells form the dorsolateral wall of the archenteron. The endodermal cells give rise to notochord and cetodermal cells lying out side. The chordal cells form the neural tube.

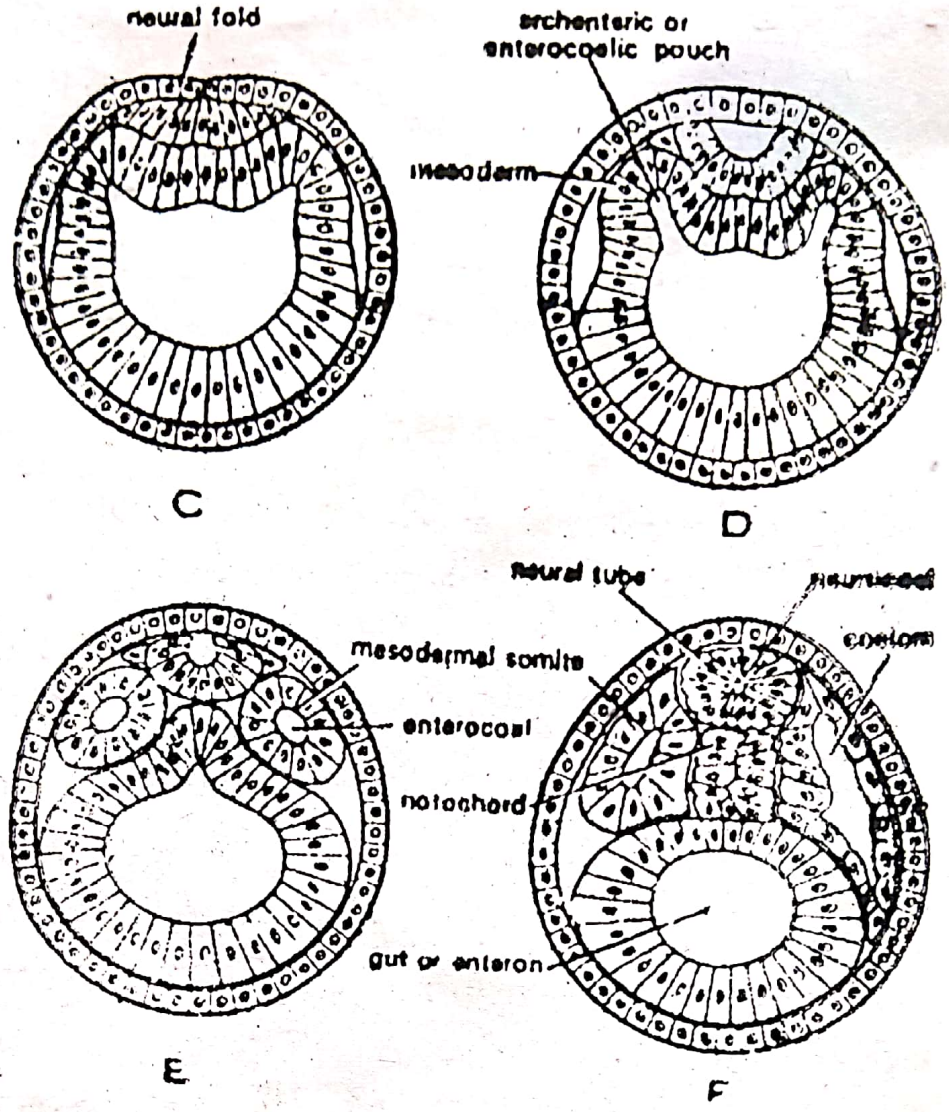
Now the embryo develops cilia in its ectodermal sells which cause to rotate the embryo inside its egg membrane.




Tubulation, organogenesis and formation of coelom—

The ectoderm cells of mid-dorsal region flattened, form a plate the medullary plate which sind down. The other ectodermal cells form the






neural folds which posteriorly enclose the balsto-pore also. The side of the neural plate start rolling up to form a neural tube. The neural tube opens anteriorly through the neuropore.

During the process a median dorsal groove develops in the archenteron. Now the cut off part of the archenteron becomes slid and forms the notochord.

During the process of formation of neural tube and notochord, two dorsolateral grooves appear in the archedteron.

The groove later on cut off from the archentiron and forms the coelomic pouches. The merodermal sacs grow between ectoderm and archenteron and fuse completely. This the coelomic cacivty becomes continuous on the ventral side and now it is termed as coelom. The outer layer of meroderm which lies in contact with the actoderm is called

as parietal layer while the inner layer which lies in contact with endoderm is termed as viscergal layer. The transverse partition or septa separating the coelomic sacs dissolve in the lateral part and thus the splanchnocoal becomes continuous laterally and ventrally.

Thus the origin of coelom in amphioxus is called entero coelic type, because it is originally derived from the archenteron.