

March - 2021

DEPARTMENT OF BIOTECHNOLOGY
B.Sc.-M.Sc. INTEGRATED PROGRAMME
SEMESTER III SUPPLEMENTARY EXAMINATION, 2021
Paper Title : DEVELOPMENTAL BIOLOGY
Paper Code - BBT-GE03 TH

Time : Three Hours

Maximum Marks : 75

Attempt all questions. All parts of a question must be attempted in continuation. Start answer of a fresh question on a new page. Cite examples and draw labeled diagrams.

Question No. 1:

[15 x 1 = 15]

Fill in all the below given blanks with appropriate terms:

- a) Sperm contribute intact _____ to the embryo.
- b) In human ovum, meiotic II arrest is broken at _____.
- c) Spermatids eject most of their cytoplasm and become the streamlined sperm during _____.
- d) The acrosome of a sperm is formed from _____.
- e) The first five to seven cleavage divisions produce a hollow ball of cells called _____.
- f) The ability of cells to respond to a specific inductive signal is called _____.
- g) Eggs that contain negligible amount of yolk are called _____.
- h) Blastulae produced by spiral cleavage typically have very small or no blastocoel and are called _____.
- i) Epithelial to mesenchymal transition involves usually _____ type of morphogenetic movement.
- j) _____ specification predominates in most insect classes.
- k) Yamanaka factors include master regulator transcription factors like _____.
- l) The process of formation of notochord is termed _____.
- m) An embryo undergoing the process of neurulation is called _____.
- n) Segmented blocks of mesoderm in either side of developing notochord is called _____.
- o) Notochord originates from embryonic germ layer called _____.

Question No. 2:

Answer ANY THREE of the following

[03 x 5 = 15]

- A. Explain Preformation vs Epigenesis mode of developmental hypothesis.
- B. Describe the process of oogenesis along with the diagram.
- C. Discuss the process of Acrosome reaction during external fertilization.
- D. What prevents polyspermy during external and internal fertilization?
- E. What are various types of eggs on the basis of amount and distribution of yolk?

Question No. 3:

[01 x 15 = 15]

Answer ANY ONE of the following:

A. Define process of cleavage and its significance. What are different types of cleavages patterns observed post fertilization?

OR

B. Explain various morphogenetic movement of cells during the process of gastrulation.

Question No. 4:

[01 x 15 = 15]

Answer ANY ONE of the following:

A. What is autonomous and conditional mode of specification? Give an account of experiments that established conditional specification.

OR

B. What is genomic equivalence and differential gene expression? How gene expression is regulated at different levels in a cell?

Question No. 5:

[03 x 5 = 15]

Answer ANY THREE of the following:

A. Describe the process of formation of central and peripheral nervous system.

B. Write a note on the development of vertebrate eye.

C. Describe the Spemann and Mangold's dorsal lip transplant experiment.

D. Draw a layout depicting origin of various tissues and organs from three different germ layers.

E. Explain the origin and role of placenta in mammals.