2015

BIOTECHNOLOGY

Paper : 103

CELL AND DEVELOPMENTAL BIOLOGY

Full Marks : 80

Time : 3 hours

The figures in the margin indicate full marks for the questions

1. Answer the following: 1x8=8

   (a) What is Antennapedia?

   (b) Define exocytosis.

   (c) Name a Group-II hormone.

   (d) What is the significance of capacitation?

   (e) Name the junction that mediates the passage of chemical or electrical signals from one cell to another.

   (f) In which phase of the cell cycle chromosomes are replicated?

   (g) Define Apoptosis.

   (h) What type of diffusion is represented by voltage-gated Na^+ channels?

2. Name the stages in which the early embryo of Drosophila melanogaster develops. 2

3. What does the cell theory propounds? 2

4. What are the membranes of chloroplast? 2

5. Differentiate between Osmosis and Diffusion. 2

6. What are the functional significance of Anchoring junctions? 2

7. What are the phases of Cell Cycle? 2

8. Write short notes on: (any two) 5x2=10

   (a) cAMP as second messengers

   (b) Active Transport

   (c) Structure of a Prokaryotic Cell

9. Write a brief note on Programmed Cell Death. 5

10. What are Belt Desmosomes? Support your answer with a schematic diagram. 5

11. Answer any two from the following: 8x2=16

   (a) What is the Endosymbiont theory? Describe briefly the biogenesis of cell organelles mitochondria and chloroplast. 2+6=8

   (b) Describe briefly the structure and function of commu-

nicating junctions. Support your answer with a suitable diagram. 8

(c) What are Group-I hormones? Explain the process by which signal is transduced by the Group-I hormones into the cell's interior. 1+7=8

12. Answer any two from the following: 12x2=24

(a) Describe the developmental pattern of Arabidopsis thaliana. Explain the genetic control involved in the process. 12

(b) Describe the structure of the nucleus. Write the functions of nuclear envelope and the nucleolus. 6+6=12

(c) What do you mean by cell-signalling? Write the significance of the process in the cell. Describe the various receptors in cell signaling emphasizing your note on the process by which G-Protein Coupled Receptors are involved in the Cell-signalling. 3+2+3+4=12

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