2018

BIOTECHNOLOGY

BIT 103

CELL AND DEVELOPMENT BIOLOGY

Full Marks : 80

Time: 3 Hours

The figures in the margin indicates full marks for the questions

1. Answer in short to the following: 1x8=8

   a. What are Plasmodesmata?

   b. Who was/were the first to propose the occurrence of lipid bilayer in the cellular membrane ?

   c. What is the composition of Peptidoglycan?

   d. What are plasmasomes and karyosomes?

   e. Give an example of eukaryotic cell that do not contain nucleus.

   f. What is the first site of RBC production?

   g. Why are stem cells called unspecialized cells?

   h. What is the significance of fertilizing-antifertilizin reaction?

2. What are the different types of cells according to the number of nuclei present? 2

3. Write in brief the procedure of Gram's staining. 2

4. What is facilitated diffusion? How does it differ from simple diffusion?

2+2=4

5. Who proposed the cell theory. What are the tenets of the cell theory?

1+3=4

6. Write short notes on any four from the following: 5x4=20

   a. $Na^{+}-K^{+}$ ATPase

   b. Cell Wall

   c. The Endo membrane System

   d. Telomerase.

   e. Egg polarity genes in the development of Drosophila melanogaster.

   f. Transduction of water insoluble signal molecule into a target cell.

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

   a. What is the nuclear envelope? What is its structural composition? Write the functions of the nuclear envelope. 2+3+3=8

   b. What are G-Protein coupled receptors? Describe its structure and functioning. 8

   c. Describe in brief what specific events that occur during mitosis of the cell cycle. 8

   d. What is p^{53} ? How is p^{53} activated? How does it affect the cell cycle? 2+3+3=8

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

a. Write a note on chromatin organization and packaging. Support your answer with relevant diagrams. 8+4=12

b. What are cellular junctions? Write a brief note on anchoring junctions and explain the different types of it. 2+10=12

c. Explain in brief the Danielli-Davson model of the plasma membrane. Support your explanation with suitable diagram. What are the functions of plasma membrane? 8+4=12

d. What are the characteristics of stem cells? Differentiate between an embryonic stem cell and an adult stem cell. 4+8=12

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