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BOTANY

(Major)

Paper : 2.2

(Theory)

(Cell Biology)

Full Marks : 60

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

1. Answer the following : 1×7=7

- (a) What are nucleoporins?
- (b) Point out at least one primary feature of a typical collagen molecule.
- (c) In the absence of a nucleus, will the ribosomes translate newly transcribed mRNA resulting in functional proteins?
- (d) What are lysosomes?
- (e) Define symmetric karyotype.

- (f) What are Okazaki fragments?
- (g) What is the function of Cdks (Cyclin-dependent kinase) in cell cycle?

2. Differentiate between the following : $2 \times 4 = 8$

- (a) Active transport and Passive transport
- (b) Transporters and Channels
- (c) Exocytosis and Endocytosis
- (d) Peripheral membrane proteins and Integral membrane proteins

3. Answer any *three* of the following : $5 \times 3 = 15$

- (a) State the properties that distinguish ion channels from aqueous pores.
- (b) Discuss the ultrastructure and function of mitochondria.
- (c) Mention the activities that take place during the interphase stage of mitotic cell cycle.
- (d) Briefly describe the fluid mosaic model of the plasma membrane.
- (e) What are enzyme coupled receptors? Describe the different classes of enzyme coupled receptors.

4. Answer any *three* of the following :

- (a) Describe the molecular components that make up the cell membrane. 10
- (b) What are intracellular signaling proteins? Explain how these intracellular signaling proteins function as molecular switches. 2+8=10
- (c) Who discovered the double-helical structure of DNA? Enumerate the detailed features of DNA double helix. Point out the differences between A-DNA and C-DNA. 1+6+3=10
- (d) With the help of neat labelled diagrams, discuss the structure and function of giant chromosomes. 10
- (e) Give an account of the mechanism involved in ER Ca^{++} pump called SERCA (Sarco Endoplasmic Reticulum Ca^{++} -ATPase). 10
- (f) Describe the three different types of secretory vesicles depending on the signal sequence. 10
