

3 (Sem-2) BOT M 2

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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 is nuclear localization sequence?
- (b)** Name a well-studied H^+ driven symporter.
- (c)** What are sorting signals?
- (d)** What is the function of tRNA?
- (e)** What are molecular switches?
- (f)** Define prometaphase.
- (g)** What is reverse transcriptase?

(2)

2. Answer any *four* of the following : $2 \times 4 = 8$

- (a) Distinguish between phagosome and phagolysosome.
- (b) What are histidine-kinase associated receptors?
- (c) What do you understand by the process called 'flip-flop'?
- (d) What is the role of sigma factor in bacterial RNA polymerase?
- (e) State the differences between heterochromatin and euchromatin.

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

- (a) Discuss the requisites for replication of DNA.
- (b) Explain the different ways in which a cell carries out active transport.
- (c) "The Golgi apparatus is a major collection and dispatch station of protein products received from the endoplasmic reticulum." Explain.
- (d) Explain briefly the mechanism of nuclear import.
- (e) Write a brief note on C-value paradox.

(3)

4. Answer any *three* of the following : $10 \times 3 = 30$

- (a) What are ion channels and are they ion-selective? If yes, explain the mechanism involved with the help of suitable figures. $2+8=10$
- (b) Discuss the various molecular events that occur at defined stages of the cell cycle.
- (c) Describe the structure and function of salivary gland chromosomes.
- (d) Describe with the help of diagram the fluid mosaic model of plasma membrane. Discuss experimental evidences in support of the fluid mosaic model. $5+5=10$
- (e) What are small intracellular mediators? How many classes of cell surface receptor proteins are there? Discuss in detail. $2+8=10$
- (f) What are integral transmembrane proteins? Explain the MAP kinase signal transduction pathway. $2+8=10$
