2026

BOTANY

(Major)

Paper: BOT4200104MJ

(Cell Biology and Biomolecules)

Full Marks : 45

Time : 2 hours

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

1. Answer the following questions : 1×5=5

a) Cell is discovered by _____ .

b) What is G2 phase in cell cycle ?

c) Name the stage of mitosis in which chromosomes are arranged on the equator of spindle

i) Anaphase ii) Metaphase

iii) Prophase iv) Telophase

d) Define purine.

e) Name one essential fatty acid.

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2. Answer the following questions (*any five*) : 2×5=10

a) Name the components of plasma membrane.

b) What is the role of CDK in cell cycle ?

c) Give one example of enucleated cell.

d) What is the main function of cell wall ?

e) What is Heterochromatin ?

f) What is structural difference between prokaryotic and eukaryotic ribosome ?

g) What is protein denaturation ?

h) What is the significance of G_2/ M checkpoint ?

i) Differentiate between endocytosis and exocytosis.

j) Why lysosome is known as suicidal bag of the cell ?

3. **Answer the following questions (*any four*) :** 5×4=20

a) Explain the three components of cytoskeleton with their roles.

b) What are the main components of plant cell wall ?

c) Differentiate between SER and RER.

d) Compare between A, B and Z DNA.

e) Explain different levels of protein structure with suitable example.

f) Explain the structure and function of different types of RNA.

g) Write a short note on nitrogenous bases and their pairing rules.

h) Differentiate between Euchromatin and Heterochromatin.

4. **Answer the following questions (*any one*) :** 10×1=10

a) Explain the structure of plasma membrane based on the fluid Mosaic Model. Discuss different types of membrane transport mechanism.

b) Describe the stages of the eukaryotic cell cycle. Give a detailed account of mitosis and meiosis with their significance.

c) Describe the ultrastructure of mitochondria with a neat labeled diagram. Why mitochondria is called semi-autonomous organelle.

d) Compare prokaryotic and Eukaryotic cells based on structure and function.

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