

Department of Botany
School of Chemical & Life Sciences
Jamia Hamdard, New Delhi-110062

B.Sc. (HONS WITH RESEARCH) / B.Sc. BOTANY
III SEMESTER EXAMINATION DECEMBER 2025

Paper Name: **Cell Biology**Paper Code: **BBO-MIC301**Time: **2½ hours**Maximum Marks: **60**

Note: This paper has 3 sections A, B, and C.

Section A: Answer all the questions. **Section B:** Attempt any 5 out of 6.**Section C:** Attempt any 2 out of 3.

Abbreviations used:

CO-Course Outcomes

CLO 1: discuss cell theory and basic cell structure (understand);**CLO 2:** explain various tools and techniques in cell biology (evaluate);**CLO 3:** relate the structure with the function of various cell organelles in an eukaryotic cell (evaluate);**CLO 4:** express knowledge about the composition of cytoskeleton and extracellular matrix (understand); and**CLO 5:** examine mechanisms of cell division and cell death (analyze).**BTL-Bloom's Taxonomy Levels**

1- Remembering, 2-Understanding, 3-Applying, 4-Analyzing, 5-Evaluating, 6-Creating

SECTION A

Very Short Type Question (15 questions)

15 x 1 = 15 marks

Q.No.	Questions	Marks	CO	BTL
1	Who proposed the cell theory?	1	1	1
2	Why is a pinhole used in confocal microscopy?	1	2	2
3	What does RPM stand for in centrifugation?	1	2	1
4	What is the role of polar amino acid residues located within the phospholipid bilayer of glucose transporter?	1	3	4
5	What is osmotic pressure?	1	3	2
6	What toxic molecule is broken down by catalase in peroxisomes?	1	3	1
7	What is the main component of the plant cell wall?	1	1	4
8	What is the major polysaccharide in fungal cell walls?	1	1	4
9	Which protein family forms the core of hemidesmosomes?	1	1	4
10	What is the main function of the nuclear pore complex?	1	3	2
11	In which organisms are polytene chromosomes commonly found?	1	5	1
12	What are the extended loops of lampbrush chromosomes used for?	1	5	2
13	What are B-chromosomes?	1	5	2

Please turn over

14	Which phase of the cell cycle is responsible for DNA replication?	1	5	1
15	During which stage of mitosis do sister chromatids separate?	1	5	2

SECTION B

Short Type Question. (Attempt any five out of six)

5 x 5 = 25 marks

Q.No.	Question	Marks	CO	BTL
1	Discuss the differences between plant and animal eukaryotic cells.	5	1	4
2	Discuss the factors affecting sedimentation during centrifugation.	5	2	4
3	Describe the fluid mosaic model, its key components, and the experimental evidence supporting this model.	5	3	4
4	Describe the role of actin-binding proteins.	5	4	2
5	Compare and contrast gap junctions with tight junctions.	5	4	4
6	What are the main checkpoints that control the cell cycle in eukaryotes.	5	5	2

SECTION C

Long type Question (Attempt any two out of three)

2 x 10 = 20 marks

Q.No.	Question	Marks	CO	BTL
1	Compare the primary and secondary active membrane transport with suitable examples.	10	3	4
2	Explain the main differences how the polymerizations processes of intermediate filament differ from that of microfilament ?	10	4	4
3	Describe the role of chromosome and its types.	10	5	3

END OF QUESTION PAPER