

Department of Botany
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M.Sc. BOTANY
I SEMESTER EXAMINATION JANUARY 2025

Paper Name: **Cell and Molecular Biology**

Paper Code: **MBO-CC102**

Time: **2 ½ hours**

Maximum Marks: **60**

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

Section A: Answer **all the questions**. Section B: Attempt any **05 out of 06**

Section C: Attempt any **02 out of 03**

Abbreviations used:

CLO-Course Learning Outcomes

CLO 1: relate the structure with the function of various cell organelles of plant cells (evaluate);

CLO 2: explain the nuclear, mitochondrial and chloroplast genomes (understand);

CLO 3: examine mechanisms of cell cycle regulation and cell death processes (analyze); and

CLO 4: describe replication and repair mechanism of DNA, synthesis and processing of RNA and protein, expression and regulation of genes at transcription, translation and post-translational level (understand/evaluate).

BLT-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	CLO	BTL
1	What is a degradosome?	1	2	1
2	Define capping of RNA?	1	4	3
3	What is a guide RNA?	1	4	2
4	Define metaphasic plate.	1	3	5
5	Give two key differences between grana and stroma.	1	2	6
6	Mention two sterols present in plant membranes.	1	1	1
7	Define retro-transposons.	1	4	1
8	What are Okazaki fragments?	1	4	1
9	Mention two key similarities between mitosis and meiosis.	1	3	4
10	What is the function of the nucleolus in plant cells?	1	1	5
11	Which is the longest phase of the cell cycle?	1	3	1
12	Organelle responsible for storing starch in plant cells is	1	2	1
13	What is the size of nucleosome?	1	2	1
14	Give two important roles of lysosomes.	1	1	6
15	What is repetitive DNA?	1	4	2

SECTION B

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

5 x 5 = 25 marks

Q. No.	Question	Marks	CLO	BTL
1	Discuss the role of cytoskeleton in the motility of organisms.	5	1	2
2	Define plant cell membrane and briefly discuss a model of cell membrane structure.	5	1	2
3	Differentiate between heterochromatin and euchromatin.	5	3	1
4	Discuss apoptosis in plant cells.	5	3	2
5	Write about lac operon and its regulatory mechanism.	5	4	1
6	Shortly write about the RNA editing and its consequences.	5	4	6

SECTION C

Long type Question (Attempt any two out of three)

2 x 10 = 20 marks

Q. No.	Question	Marks	CLO	BTL
1	Explain the mechanism of elongation during DNA replication. Also, enlist and their role (s) of enzymes involved in DNA replication	10	4	2
2	Describe briefly about cell cycle. What are cyclins and cyclin dependent kinases and their roles during regulation of cell cycle?	10	3	6
3	How transcription factors can help during transcription process? Mention the role of all transcription factors in eukaryotic and prokaryotic transcription.	10	4	2,6

*****End of Question Paper*****