

B.Sc. (HONS) BOTANY
III SEMESTER EXAMINATION MARCH 2024

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.

Instructions: An equal representation of each course outcome should be done in each section.

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 (12 questions)

15 marks

Q.No.	Questions	Marks	CO	BTL								
1	Arrange the following in correct order of events: (i) S-phase (ii) M-phase (iii) G2 phase (iv) G1 phase	1	1	3								
2	Out of the three – Phosphoglyceride, Sphingolipids and cholesterol, which is the most abundant class of lipids in biological membranes?	1	3	4								
3	Match the most appropriate pairs: <table border="1"><tr><td>Ruska and Knoll</td><td>Salivary glands of Drosophila</td></tr><tr><td>Hartwell, Hunt and Nurse</td><td>Lysosome</td></tr><tr><td>Christian De Duve</td><td>Electron microscope</td></tr><tr><td>Lampbrush chromosome</td><td>Cell cycle regulation</td></tr></table>	Ruska and Knoll	Salivary glands of Drosophila	Hartwell, Hunt and Nurse	Lysosome	Christian De Duve	Electron microscope	Lampbrush chromosome	Cell cycle regulation	2	2,3	2
Ruska and Knoll	Salivary glands of Drosophila											
Hartwell, Hunt and Nurse	Lysosome											
Christian De Duve	Electron microscope											
Lampbrush chromosome	Cell cycle regulation											
4	Crossing over occurs at _____ stage of _____.	2	2	3,5								
5	The Cell theory was proposed by _____ and _____.	1	2	1								
6	Sedimentation coefficient is measured by _____.	1	2	2								
7	Nucleolus is the site for _____.	1	3	3								
8	Failure of transport of VLCFA into peroxisome causes Zellweger Syndrome. True/False.	1	2	3								
9	Desmotubules and annulus are found in _____ whereas hemidesmosomes are found at _____.	2	3	3								

10	Cystic fibrosis is a genetic disorder associated with _____ ion channel.	1	2	4
11	The puffed sites on Polytene chromosomes are associated with _____.	1	2	4
12	Gap junctions are composed of the protein _____.	1	2	4

SECTION B

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

5 x 5 = 25 marks

Q.No.	Question	Marks	CO	BTL
1	Prepare a comprehensive account of (i) treadmilling phenomena (ii) adhesive interactions between different cells	5	3	4
2	Compare and contrast the cell wall structure and composition in bacteria and fungi?	5	3	3
3	With the help of labelled diagram, write the principle and functioning of electron microscopy.	5	2	2
4	Prepare brief notes on the structure and function of the following organelles (i) Endoplasmic reticulum (ii) Ribosome	5	3	2
5	Prepare an account of organization, and mechanism of assembly of tubulins.	5	3	2
6	Draw labelled diagrams only of the following: (i) Nuclear Pore complex (ii) Meiosis	5	5	4

SECTION C

Long type Question (Attempt any two out of three)

2 x 10 = 20 marks

Q.No.	Question	Marks	CO	BTL
1	With the help of labelled diagrams, compare the structure of chloroplast and mitochondrion. Prepare a detailed account of the role of mitochondrion as “powerhouse of the cell”.	10	3	2,3
2	Prepare a detailed account of intra-cellular and inter-cellular transport with special reference to (i) Ion-channels and membrane pumps (ii) Exportin-Importin based transport (iii) Protein sorting	10	3	3
3	“Cyclins and Cdks are essential for regulation of eukaryotic cell cycle and as check-points”. Justify the statement. Prepare a well labelled diagram to illustrate the mitosis cell division in a cell.	10	5	2,3
