

Exam.Code:0435  
Sub. Code: 3465

2123

**M. Sc. (Biotechnology), First Semester  
MBIO-101: Cell Biology**

**Time allowed: 3 Hours**

**Max. Marks: 80**

**NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting one question from each Unit.**

x-x-x

1. Attempt the following:-

(8x2)

1. What are co-acervates?
2. Why is metal used for staining specimens in electron microscopy?
3. Role of marker enzymes in subcellular fractionation?
4. Difference between bright field and dark field microscopy?
5. What is active transport, passive transport and facilitated diffusion?
6. What cyclin-CDKs and their role in cell cycle?
7. What are Autocrine, paracrine and endocrine signaling?
8. Clatherin coated vesicles?

**UNIT-I**

Q2.a. Discuss the evolutionary steps of origin of cells starting from chemical to biological evolution? 8

b. Explain the principle and working of confocal microscopy? Why confocal microscopy is better than fluorescence microscopy? 8

Q3.a. Discuss the principle of electron microscopy and mention how TEM is different from SEM in resolution and magnification? 8

b. Describe all the methods of sample Preparation for electron microscopy? 8

**UNIT-II**

Q4.a. Discuss in detail the structure and function of plant cell wall? 8

b. Give the principle, working and applications of FACS? 8

Q5.a. What are various classes of transport proteins? Mention the working of  $\text{Na}^+/\text{K}^+$  pump and its role in medicine? 8

b. Explain the role of cellular energy transaction in mitochondria? 8

**UNIT-III**

Q6.a. Using *Sacharomyces cereviseae* as the model system discuss the experimental evidence that indicates that cyclin B is required for a cell to enter mitosis and destroyed to exit mitosis in a cell cycle? 8

(2)

- b. Discuss the Ras/MAPK pathway of signal transduction? 8
- Q7.a. Discuss the various check points regulation which works during cell cycle? 8
- b. Define signal transduction? Describe the TGF $\beta$  pathway of signaling? 8

#### UNIT-IV

- Q8.a. Discuss the intracellular protein trafficking through ER and Golgi complex? 8
- b. What is post translational modification? Discuss the phosphorylation and O-Glycosylation modification on proteins? 8
- Q9.a. Discuss the vesicle formation and fusion during protein trafficking? 10
- b. Discuss the molecular mechanism of movement of cilia and flagella? 6

x-x-x