

QP Code : P24A031

Reg. No : .....

Name : .....

**ST MARY'S COLLEGE (AUTONOMOUS), THRISSUR-20**

**I SEMESTER M.Voc (CBCSS-VPG) DEGREE EXAMINATION, November 2024**

**M.Voc Applied Biotechnology**

**SDC1AB01 : Cell and Molecular Biology**

**2024 Admission Onwards**

**Time : 3 Hours**

**Maximum Weightage : 30**

**Part A**

*Short answer type questions: Answer **any four** questions. Weightage 2 for each question*

1. Discuss on the different types of cytoskeleton filaments. [BTL2]
2. Describe the role of protein kinases and phosphatases in signal transduction. [BTL3]
3. Explain the concept of ribozyme technology and its significance in molecular biology. [BTL3]
4. Describe the mechanisms by which inhibitors of protein synthesis function. [BTL2]
5. Explain briefly Na<sup>+</sup>/glucose transporter with a neat diagram. [BTL1]
6. Describe the properties of genetic code and explain the importance of the wobble hypothesis. [BTL4]
7. Detail the molecular mechanism by which miRNAs regulate gene expression in eukaryotic cells. [BTL3]

**(4x2 = 8 Weightage)**

**Part B**

*Short essay-type questions: Answer **any four** questions. Weightage 3 for each question*

8. Describe the basic structure, organization, and composition of prokaryotic and eukaryotic cells. [BTL1]
9. Evaluate the efficiency and specificity of the protein transport systems to mitochondria, chloroplasts, and peroxisomes [BTL5]
10. Briefly explain the general principles of cell signalling. [BTL2]
11. Design the DNA repair mechanism in response to double-strand breaks and base mismatches. [BTL6]
12. Explain the mechanism of protein localization. [BTL1]

**Turn Over**

13. Compare the processes of apoptosis and necrosis [BTL3]
14. Compare the effectiveness of different DNA replication inhibitors on prokaryotic and eukaryotic cells. [BTL5]

(4x3 = 12 Weightage)

### Part C

*Essay-type questions: Answer **any two** questions. Weightage 5 for each question*

15. Compare and contrast the contributions of the Hershey-Chase and Meselson-Stahl experiments to our understanding of DNA as the genetic material. [BTL2]
16. Compare and contrast the three types of eukaryotic RNA polymerases (RNA polymerase I, II, and III) in terms of structure, function, and transcriptional regulation. [BTL2]
17. Describe the structure and function of his operon in *Escherichia coli*. [BTL1]
18. Analyze the role of bacterial RNA polymerases in transcription mechanisms and regulation. [BTL3]

(2x5 = 10 Weightage)

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