

QP Code : P24A012

Reg. No :

Name :

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

I SEMESTER M.Sc. (CBCSS-PG) DEGREE EXAMINATION, November 2024

MSc Biology

BIO1C02 : 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. What is the role of chromatin in regulating gene expression? [BTL2]
2. Compare different types of mutations. [BTL2]
3. Identify the role of alu elements in creating genetic diversity? [BTL3]
4. How can the concept of gene families be applied to study complex traits and polygenic diseases? [BTL3]
5. Explain the methylation of RNA with suitable figures. [BTL2]
6. Compare and contrast plasmid DNA and chromosomal DNA? How they differ in their functions. [BTL4]
7. Explain the importance of TIL in cancer treatment. [BTL3]

(4x2 = 8 Weightage)

Part B

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

8. What role does DNA polymerase α play in eukaryotic DNA replication, and how does it differ from DNA polymerase δ and ϵ ? [BTL1]
9. How do DNA transposons move within the genome? [BTL1]
10. Identify how the Cot value reflects the complexity of a genome, and what does it reveal about the DNA sequence composition in terms of repetitive and unique sequences? [BTL3]
11. Compare the pros and cons of different gene editing technologies. Analyze the relative advantages of specific types of genetic modifications. [BTL4]
12. Discuss the concept of "star activity" in restriction enzymes and its implications for experimental outcomes. [BTL5]

Turn Over

13. Compare and contrast the structural and functional differences between single-subunit and multi-subunit phage RNA polymerases? [BTL4]
14. How do mutations in the p53 gene contribute to cancer development, and what are the common types of mutations observed? [BTL2]
- (4x3 = 12 Weightage)**

Part C

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

15. Find the differences between gene regulation in phage and bacteria. [BTL1]
16. How to differentiate between virus-induced cancer from other cancers? [BTL1]
17. For making linear polypeptides of amino acid, functional folding, and modifications are required. Identify the role of chaperones and other modifications of protein. [BTL3]
18. What are the current challenges in effectively delivering CRISPR components to specific cells or tissues, and what innovative strategies are being developed to overcome these challenges? [BTL3]
- (2x5 = 10 Weightage)**

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