QP Code: PV25B005

Reg. No : .....

Name : .....

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

II SEMESTER (CBCSS-VPG) DEGREE EXAMINATION, MARCH 2025

M Voc Applied Biotechnology

SDC2AB03 : GENETIC ENGINEERING

2024 Admission Onwards

Time:3 Hours **Maximum Weightage:30**

Part A

*Short answer type questions: Answer **any four** questions. Weightage **2** for each question.*
(4x2 = 8 Weightage)

1. Describe the role of polyethylene glycol in yeast transformation. [BTL2]
2. Explain role of kinases as tools of genetic engineering. [BTL2]
3. Compare and contrast genomic DNA cloning and cDNA cloning in terms of source material, gene representation, and applications. [BTL2]
4. Explain the role of promoters in gene expression regulation in *E.coli*. [BTL2]
5. Apply the concept of restriction enzyme digestion in constructing a physical map of a bacterial genome. [BTL3]
6. Compare and contrast RFLP, RAPD, and AFLP based on sensitivity, reliability, and cost-effectiveness. [BTL4]
7. Evaluate the impact of plasmid size on transformation efficiency and suggest strategies to improve uptake of larger plasmids. [BTL5]

Part B

*Short essay-type questions: Answer **any four** questions. Weightage **3** for each question.*
(4x3 = 12 Weightage)

8. Explain the principles behind gene therapy and its applications in genetic disorders. [BTL2]
9. Describe the Gene Gun method. [BTL2]
10. How would you design a synthetic DNA sequence using the phosphodiester method? Outline the steps involved. [BTL3]
11. Apply Northern blotting to analyze gene expression in different tissue samples. [BTL3]

Turn Over

12. Evaluate the use of blue-white screening in identifying recombinant clones. What are the strengths and weaknesses of this technique, particularly when used for libraries derived from different organisms? [BTL4]

13. Compare and contrast autosomal dominant and recessive inheritance using pedigree analysis. [BTL4]

14. If a forensic investigator retrieves a degraded DNA sample from a crime scene, how could PCR help in identifying the suspect. [BTL3]

Part C

*Essay-type questions: Answer **any two** questions. Weightage **5** for each question.*
(2x5 = 10 Weightage)

15. Explain on various types of PCR and its applications. [BTL2]

16. List the different types of vectors commonly used in recombinant DNA technology. [BTL1]

17. Apply Sanger sequencing to determine the nucleotide sequence of a short DNA fragment. [BTL3]

18. Analyze the advantages and limitations of radioactive vs. non-radioactive labeling in molecular biology experiments. [BTL4]

****