(Pages : 2) **S – 7641**

Reg. No. : .....

Name : .....

Third Semester M.Sc. Degree Examination, February 2024

Biotechnology

BT 303 : GENETIC ENGINEERING

(2018-2019 Admission)

Time : 3 Hours Max. Marks : 75

I. Answer any **two** of the following:

1. Explain the molecular tools used in genetic engineering, focusing on vectors and restriction enzymes.

2. Discuss the techniques used in DNA analysis, including the labeling of DNA and RNA probes. Explain the principles behind each technique and their applications in molecular biology and genetics.

3. Explain the principle of Polymerase Chain Reaction (PCR) and its applications. Discuss various types of PCR and their significance in molecular biology research.

(2 × 15 = 30 Marks)

II. Answer any **nine** of the following:

4. Compare and contrast microsatellites and minisatellites as molecular markers.

5. What is the difference between a genomic library and a cDNA library? Discuss their respective preparation methods.

P.T.O.

6. Describe the principle behind Northern blotting and its application in gene expression analysis.

7. Explain the difference between physical mapping and molecular mapping in DNA analysis.

8. Discuss the industrial applications of genetic engineering, focusing on the production of recombinant proteins.

9. Explain the role of Sequence-Tagged Microsatellite Sites (STMS) in molecular genetics.

10. Compare and contrast Maxam-Gilbert and Sanger sequencing methods.

11. Discuss the various vectors commonly employed in genetic transformations and their significance in biotechnology.

12. Provide examples of techniques used in protein engineering.

13. Explain the significance of molecular markers in genetic research.

14. Evaluate the challenges and limitations associated with chromosome walking techniques, particularly in the context of large and complex genomes.

15. Explore the diverse applications of NGS technology in biological research and medical diagnostics.

($9 \times 5 = 45$ Marks)

———————