D 121206 **(Pages : 2)** **Name.....**

Reg. No.....

FOURTH SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, APRIL 2025

(CBCSS)

Botany

BOT 4E02 3—GENETIC ENGINEERING

(2019 Admission onwards)

Time : Three Hours Maximum : 30 Weightage

Section A (Short Answer Type Questions)

Answer any **four** *questions.*
Each question carries 2 *weightage.*

1. What is gene cloning ?
2. What is the genetic code, and how is it represented ?
3. Briefly describe the structure of genes in prokaryotes and eukaryotes.
4. How do chemical methods of gene transfer differ from other techniques ?
5. Differentiate between microsatellite and minisatellite molecular markers.
6. What are the different types of gene therapy ?
7. What is Nanotechnology ?

(4 × 2 = 8 weightage)

Section B (Short Essay Type Questions)

Answer any **four** *questions.*
Each question carries 3 *weightage.*

8. Define codons and explain their role in protein synthesis.
9. Describe recombinant DNA technology and its advantages.
10. Differentiate between southern and northern blotting techniques.
11. What is electroporation, and how is it applied in plant gene transfer ?

Turn over

12. Briefly describe the chemical and enzymatic methods of DNA sequencing.

13. What is PCR ? Discuss the variations of PCR from the basic method.

14. What are the applications of DNA profiling in forensic science ?

(4 × 3 = 12 weightage)

Section C (Long Essay Type Questions)

Answer any **two** *questions.*
Each question carries 5 *weightage.*

15. How is genetic engineering used to improve crops, specifically in creating transgenic plants ? Explain.

16. Explain the process of cloning genes for the production of vaccines, drugs and growth hormones.

17. Discuss the potential benefits and challenges associated with using genetically engineered microorganisms for pollution abatement.

18. Describe different molecular markers and their advantages with suitable examples.

(2 × 5 = 10 weightage)