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Reg. No....................................

THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2025

(CBCSS)

Botany

BOT 3C 09—BIOTECHNOLOGY AND BIOINFORMATICS

(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 the purpose of callus culture in plant tissue culture ?

2. What is a somatic hybrid ?

3. What is the purpose of a Southern blot ?

4. Write a short note on FISH.

5. What is cloning in biotechnology ?

6. What is the significance of the Open Archive Initiative (OAI) in online publications ?

7. What is HTTP in Internet ?

(4 × 2 = 8 weightage)

Section B (Short Essay Type Questions)

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

8. How transgenic plants are created using vector-independent methods ?

9. How has computational biology contributed to the study of genetics and genomics ?

10. What are SCOP and CATH used for in the context of protein structure classification ?

11. Define pharmacogenomics and its relevance to personalized medicine.

Turn over

12. What is the focus of comparative genomics in bioinformatics ?

13. Describe organogenesis in plant tissue culture.

14. Describe the concept of DNA microarrays and their role in functional genomics.

(4 × 3 = 12 weightage)

Section C (Long Essay Type Questions)

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

15. Discuss the ethical considerations and biosafety protocols associated with recombinant DNA safety and the patenting of biological inventions.

16. Describe the principles and applications of Restriction Fragment Length Polymorphism (RFLP) and Random Amplified Polymorphic DNA (RAPD) in molecular biology.

17. Discuss the principles and advantages of using bioreactors for large-scale cultivation of plant cells in the production of secondary metabolites. Highlight the challenges and considerations in bioreactor-based plant tissue culture.

18. Outline the strategies involved in constructing and screening gene and cDNA libraries. How are these libraries valuable resources for molecular biology research ?

(2 × 5 = 10 weightage)