D 51229 **(Pages : 2)** **Name.....**

Reg. No.....

THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2023

(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 a somatic hybrid ?
2. What are synthetic seeds in plant tissue culture ?
3. What is the basic principle behind PCR (Polymerase Chain Reaction) ?
4. What is the function of DNA chips in molecular analysis ?
5. What are the applications of DNA fingerprinting ?
6. What is the significance of the Open Archive Initiative (OAI) in online publications ?
7. Name two nucleic acid databases commonly used in bioinformatics.

(4 × 2 = 8 weightage)

Section B (Short Essay Type Questions)

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

8. Briefly explain the Sanger sequencing method.
9. What is gene piracy in patenting genes and GMOs ?
10. Briefly explain the concept of biosafety protocols in recombinant DNA technology.
11. How has computational biology contributed to the study of genetics and genomics ?
12. What does URL stand for, and what is its purpose on the web ?

Turn over

13. Describe the scope of bioinformatics and its applications.

14. How does medical informatics contribute to healthcare and research ?

(4 × 3 = 12 weightage)

Section C (Long Essay Type Questions)

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

15. Describe the essential laboratory facilities required for plant tissue culture and explain the principles of proper laboratory management in tissue culture research.

16. Describe Southern, Northern, and Western blots techniques. Explain the specific applications and limitations of each method.

17. Discuss the significance of chromosome walking and jumping in genome mapping and sequencing. How do these techniques contribute to our understanding of complex genomes ?

18. Discuss the key enzymes and vectors used in recombinant DNA technology. Explain their roles in gene cloning and genetic engineering.

(2 × 5 = 10 weightage)