D 150264 **(Pages : 2)** **Name.....**

Reg. No.....

THIRD SEMESTER M.Sc. DEGREE (CBCSS) REGULAR / SUPPLEMENTARY EXAMINATION, NOVEMBER 2026

Botany

BOT3C09—BIOTECHNOLOGY AND BIOINFORMATICS

(2019 Admission onwards)

Time : Three Hours Maximum : 30 Weightage

Section A–Short answer type questions

Answer any **four** *questions.*

1. Define plant tissue culture. Mention any two basic requirements for successful *in vitro* culture.
2. What is cryopreservation ? Mention its importance in germplasm conservation.
3. What is somatic embryogenesis ? How does it differ from organogenesis ?
4. What are restriction enzymes? Mention their role in recombinant DNA technology.
5. Distinguish between Southern blotting and Northern blotting.
6. What is a biological database ? Name any two nucleic acid sequence databases.
7. Write a short note on FISH and its applications.

(4 × 2 = 8 weightage)

Section B-Short essay type questions

Answer any **four** *questions.*

8. What are bioreactors ? Mention their importance in secondary metabolite production.
9. Explain the isolation of single cells from plant tissues by mechanical and enzymatic methods.
10. Describe PCR and explain its major steps and applications.
11. Explain the construction and screening of genomic and cDNA libraries.
12. Differentiate between GenBank, EMBL and UniGene databases.
13. Explain pairwise sequence alignment and distinguish between identity and similarity.
14. Describe the major applications of bioinformatics in functional genomics and comparative genomics.

(4 × 3 = 12 weightage)

Turn over

Section C - Long essay type questions

Answer any **two** *questions.*

15. Discuss callus culture with reference to explant selection, culture medium, types of callus and growth phases.

16. Describe recombinant DNA technology and the steps involved in gene cloning and screening of recombinant clones.

17. Discuss transgenic plants and the major methods used for gene transfer. Explain selection and identification of transformed plants and major applications of plant genetic engineering.

18. Explain biological databases and sequence database searching, with special reference to BLAST, BLOSUM, sequence similarity and multiple sequence alignment.

(2 × 5 = 10 weightage)