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T – 5654

Reg. No. :

Name :

Fourth Semester M.Sc. Degree Examination, July 2024

Botany

BO 242 A : BIOTECHNOLOGY

(2019 Admission Onwards)

Time : 3 Hours

Max. Marks : 75

Instruction : Draw diagrams and illustrate with examples wherever necessary.

I. Answer the following questions.

1. What are the applications of somaclonal variations?
2. What are androgenic embryos?
3. Explain the significance of selectable markers in genetic engineering.
4. What are expression vectors?
5. Define cellular totipotency.
6. Define explant.
7. Why do plasmids under relaxed control of replication only are commonly used as vectors in genetic engineering.
8. What are the unique features of the restriction sites for type II Restriction enzymes?
9. Give any two important genetic engineering products used in medicine and mention their applications.
10. What is in situ hybridization?

(10 × 1 = 10 Marks)

P.T.O.



II. Answer the following questions in not more than **50** words.

11. (a) What is meant by site directed mutagenesis?

OR

(b) Explain lipofection.

12. (a) Write a brief description on Bt plants.

OR

(b) What are cosmids? Comment on its benefits.

13. (a) Compare and contrast RFLP and AFLP.

OR

(b) Describe the use of laminar flow hood in plant tissue culture laboratory.

14. (a) What is Bioethanol? Comment on its benefits.

OR

(b) What are probiotics? Explain their benefits.

15. (a) What is Biopiracy?

OR

(b) What is somatic hybridization?

(5 × 2 = 10 Marks)

III. Answer the following questions in not more than **150** words.

16. (a) Describe how hairy root culture is exploited to produce secondary metabolites.

OR

(b) What is binary vector?

17. (a) Distinguish between genomic library and cDNA library.

OR

(b) Write a critical note on gene therapy.



18. (a) Explain the advantages and disadvantages of micropropagation.

OR

(b) Describe the general features of a bioreactor.

19. (a) Explain the advantages of cybrids.

OR

(b) Explain the use of homopolymer tailing to ligate blunt-end fragments. What is the limitation of this technique?

20. (a) What are the features that are necessary in a cloning vector?

OR

(b) Explain the basic principle, procedure and applications of Western blotting.

21. (a) The natural DNA transmission capabilities of *Agrobacterium tumefaciens* has been explored and exploited in plant genetic engineering. Explain how.

OR

(b) What are the applications of human DNA fingerprinting?

22. (a) Comment on the pros and cons of patenting genes.

OR

(b) Describe the general composition of a plant tissue culture medium. Add a note on the usual steps involved in the preparation of medium.

(7 × 5 = 35 Marks)

IV. Answer the following in not more than **250** words.

23. (a) Give a detailed account on applications of genetic engineering in agriculture and medicine.

OR

(b) Explain briefly the steps involved in tissue culture procedure.

24. (a) Explain Sanger dideoxy method of DNA sequencing. Explain the modifications that are made in the original method for automation.

OR

(b) Describe the procedure and applications of different types of blotting techniques.

(2 × 10 = 20 Marks)

