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**S – 6854**

**Reg. No. :** .....

**Name :** .....

**Third Semester M.Sc. Degree Examination, February 2024**

**Botany**

**BO 233 : MOLECULAR BIOLOGY, IMMUNOLOGY AND PLANT  
BIOTECHNOLOGY**

**(2019 Admission Onwards)**

Time : 3 Hours

Max. Marks : 75

I. Answer the following questions.

1. What are epitopes?
2. What are cosmids?
3. What is somaclonal variation?
4. Define callus.
5. Differentiate between direct and indirect organogenesis.
6. What is a polyhaploid?
7. What is RAPD?
8. Name any two methods of second-generation DNA sequencing.
9. Define telomere.
10. Expand CRISPR/Cas.

**(10 × 1 = 10 Marks)**

P.T.O.



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

11. (a) Draw a rough sketch showing the important features of Ti plasmid.

OR

(b) Write a brief note on Cry protein and its significance.

12. (a) What are the fundamental abilities of plants that determine the success of plant tissue culture?

OR

(b) Comment on the disadvantages of GM organisms.

13. (a) Expand and explain FISH.

OR

(b) Comment on HLA system.

14. (a) How are cybrids useful in crop improvement programs?

OR

(b) Write one method for haploid plant production in vitro.

15. (a) What are the limitations of haploid plants?

OR

(b) Differentiate between Binary and Cointegrative vector.

**(5 × 2 = 10 Marks)**

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

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

OR

(b) Explain the role served by knockout mice as valuable animal models for human genetic disease studies.



17. (a) Explain the vector-less methods of gene transfer in plants.

OR

(b) How does telomerase help replicate the ends of a linear chromosome?

18. (a) What is DNA footprinting? Explain its procedure.

OR

(b) Describe the procedure and applications of meristem culture.

19. (a) Describe the steps involved in the creation of cDNA library. What is the main advantage of cDNA library over genomic library?

OR

(b) Write the advantages and disadvantages of whole cell immobilization?

20. (a) Explain the methods used for ligations of blunt end fragments of DNA.

OR

(b) Give a brief account on germplasm and its conservation.

21. (a) Free-cell suspension culture is the most suitable method of large-scale production of metabolites in culture. Justify.

OR

(b) Explain the principle, procedure and applications of ELISA.

22. (a) Write an account on MHC molecule.

OR

(b) State are characteristics of good vaccines?

**(7 × 5 = 35 Marks)**



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

23. (a) Write an account on the procedure and types of polymerase chain reaction.

OR

(b) Briefly describe the procedure and applications of various blotting techniques you have studied.

24. (a) Explain the methods used for the screening and selection of recombinant cells in genetic engineering procedure, using marker genes.

OR

(b) Explain the protocol for the isolation, culture and fusion of plant protoplasts. Add a note on the applications of protoplast culture.

**(2 × 10 = 20 Marks)**

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