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Question Paper Code: 2145098

B.E. / B.Tech. DEGREE EXAMINATIONS, NOV/ DEC 2024
Fifth Semester
Biotechnology
U20BT502 – PRINCIPLES OF GENETIC ENGINEERING
(Regulation R2020)

Time: Three Hours Maximum: 100 Marks

Answer ALL questions

PART – A (10 x 2 = 20 Marks)

1. What are cosmids?

2. Distinguish between linkers and adaptors.

3. Write the characteristics of Ti plasmid.

4. How do you design a DNA probe to detect an unknown gene?

5. What are molecular beacons?

6. Explain the principle involved in alpha complementation.

7. Comment on hot start PCR.

8. How touchdown PCR increases the specificity of amplification reaction?

9. Give two examples of gene cloning in plants.

10. What is transcriptional gene silencing (TGS) in transgene silencing?

PART – B (5 x 16 = 80 Marks)

11. (a) You are asked to clone a large DNA fragment in YAC. Detail the steps involved in cloning and selection of the recombinant colony. Also, add a note on the advantages and limitations of YAC. (16)

(OR)

(b) Illustrate the significance of restriction and modification enzymes in construction of rDNA molecules. (16)

12. (a) Summarize the steps of genomic DNA and cDNA library construction with diagram. (16)

(OR)

(b) Describe the different steps involved in expression library construction. (16)

13. (a) From a cDNA library how will you screen for, (16)
A) A clone that carries a gene for tryptophan biosynthesis.
B) Genes that are expressed only in the cancer tissues.

(OR)

(b) Explain the principles and steps involved in blotting method which is used to detect a specific DNA sequence and protein with a neat sketch. (16)

14. (a) In what ways PCR technique can be exploited for viral and genetic disease detection? (16)

(OR)

(b) Explain the steps of Maxam Gilbert and Sanger methods of DNA sequencing with suitable diagram. (16)

15. (a) What is site directed mutagenesis? Describe in detail any two methods of site directed mutagenesis. (16)

(OR)

(b) Highlight the application of recombinant DNA technology in the development of Bt cotton. Also, explain why Bt cotton remains to be a controversial product? (16)

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