

Date:05-03-2022

Registration number:

ST. JOSEPH’S COLLEGE (AUTONOMOUS), BENGALURU-27

MSc. MICROBIOLOGY - III SEMESTER

SEMESTER EXAMINATION: OCTOBER 2021

(Examination conducted in January-March 2022)

**MB 9118 – Recombinant DNA Technology**

Time- 2 ½ hrs Max Marks-70

This question paper contains one printed page and four parts

**I. Answer any Five of the following. 5x3=15**

1. Differentiate alkaline phosphatase in comparison to polynucleotide kinase.
2. What are expression vectors? What purpose do they serve in recombinant DNA technology?
3. What is invitro translation technique? Write two sentences about its significance in genetic engineering.
4. What is restriction cleavage pattern analysis?
5. Illustrate nucleic acid hybridisation for blotting techniques.
6. Define microarray technology? List the types of micro arrays.
7. What are the applications of synthetic oligonucleotides in the field of life sciences?

**II. Answer any Five of the following. 5x5=25**

1. Write a comparative account on types of restriction endonucleases.
2. List the features of YACS. Why are they considered as high capacity cloning vectors?
3. Describe the principle and methodology involved in Electroporation.
4. What possible options are available to get the DNA fragment/Gene of interest to be cloned in vectors?
5. Illustrate any two strategies towards construction of cDNA.
6. Describe the events that occur in a real time PCR.
7. Write a note on the environmental impact of the release of GMOs.

**III. Answer any Two of the following. 2X10=20**

1. Describe the mechanism of DNA ligation. Write a note on the factors that affect enzyme catalysis.
2. Describe automated DNA sequencing with the help of a neat diagram. Write applications of DNA sequencing.
3. What are transgenic plants? How plants are made herbicide resistant? Describe it

with the help of a neat diagram.

**IV. Answer the following. 1x10=10**

1. **A.** A cloned gene in an expression host showed leaky expression even before the addition of inducer. How would this problem be addressed? **4**

**B.** Three vials of linear double stranded DNA sample labelled A, B and C was treated with DNAse I, RNAse H and Type II restriction endonucleases respectively. What reactions are expected in the vials? If the samples are electrophoresed on Agarose gel, what results are observed on the gel? **6**