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

Register Number:

Date:2-12-22

**M.Sc. MICROBIOLOGY – III SEMESTER**

**SEMESTER EXAMINATION: OCTOBER 2022**

**(Examination Conducted In December 2022)**

**MB 9121: RECOMBINANT DNA TECHNOLOGY**

**Time: 2 1/2 hrs. Max. Marks: 70**

This question paper has **2** printed pages and **4** parts

1. **Answer any Five of the following 5x3=15**
2. Differentiate *E. coli* DNA ligase with that of T4 DNA ligase.
3. What marker genes are used for screening of recombinants if λ phage DNA is used for gene cloning? Brief one selection strategy used to identify recombinants.
4. Draw a neat labelled diagram of an expression vector.
5. Describe in brief immunological screening of recombinants.
6. What applications do M13 phage vectors find in genetic engineering?
7. What are virulence genes seen in Ti-Plasmid? How do they help in *Agrobacterium* mediated gene transfer?
8. Write a note on the enzymatic synthesis of DNA.
9. **Answer any Five of the following 5x5=25**
10. Illustrate DNA fingerprinting.
11. What is *invitro* packaging? How is this technique used in genetic engineering?
12. Write the principle and procedure involved in microinjection?
13. Discuss the applications of microarray technology.
14. Mention the challenges involved in primer designing.
15. Define genome editing. How is it carried out?
16. What are the ethical, environmental and social issues related to rDNA technology?
17. **Answer any Two of the following 2x10=20**
18. a. Describe the mechanism of DNA ligation with suitable illustration. 6

b. Differentiate primers with probes. 4

1. List types of PCR. Describe any two of them with special emphasis on their applications.
2. Describe any two methods of cDNA synthesis with the help of neat labelled diagram.

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

1. Gene of interest of 999 nucleotide has been cloned in a vector. The recombinant plasmid has been moved into host bacteria and is plated on suitable media to screen for the recombinants.
   1. If LB Agar with ampicillin shows the presence of recombinant colonies how will you confirm that the colonies growing on medium has gene of interest? 4
   2. The gene of the interest is cloned in an expression vector. How would you confirm that the gene is cloned in an expression vector and not in a general gene cloning vector? 3
   3. If the gene is expressed what would be the molecular weight of the expressed protein? What test or technique will you perform to confirm the molecular weight of the protein? 3