

U.G. 4th Semester Examination - 2022**MICROBIOLOGY****[HONOURS]****Course Code : MB-H-CC-L-09****(Recombinant DNA Technology)**

Full Marks : 40

Time : $2\frac{1}{2}$ Hours*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.*1. Answer any **five** of the following question:

2×5=10

- i) In which cycle precise target region is produced for first time in PCR?
- ii) What are contigs?
- iii) Give example of a restriction endonuclease that generates blunt end.
- iv) Why replication-incompetent adenovirus vectors are employed as vaccine delivery vehicles?
- v) What activity is lacking in Taq polymerase and how could it be overcome? 1+1
- vi) What is the role of TEMED in PAGE?

- vii) What are the selectable markers in pBR322?
- viii) How can we purify eukaryotic mRNA from total RNA?

2. Write short notes on any **two**: 5×2=10

- i) Linkers and Adaptors
- ii) Mammalian SV40-based expression vectors
- iii) Genomic DNA libraries
- iv) Site directed mutagenesis

3. Answer any **two** from the following: 10×2=20

- i) Differentiate between cloning vector and expression vector. Why certain cloning vectors are called Artificial Chromosomes? State the importance of β -Galactosidase as a reporter gene. How is this gene used in pUC8?

3+2+2+3

- ii) What are the applications of denaturing and native gel? How do these techniques differ in gel component and sample preparation? Discuss the molecular principle of protein separation in resolving gel of SDS-PAGE.

2+3+5

- iii) Schematically represent the cloning steps using a phage-based vector. What is directional cloning?

7+3

[Turn Over]

- iv) Discuss the mechanism of action of a fluorescent probe during real time PCR. What is indicated by lower Ct value in this technique? Why do you require enzyme of retroviral origin in RT-PCR? Discuss automated sequencing, emphasizing its advantage over traditional sequencing. 3+2+2+3
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