(i) Printed Pages : 3 Roll No. .....

(ii) Questions : 9 Sub. Code : 2 5 9 4 7

Exam. Code : 0 4 3 7

M.Sc. Bio-Technology 3rd Semester

(2124)

GENETIC ENGINEERING

Paper–MBIO-302

Time Allowed : Three Hours] **[Maximum Marks : 80**

Note :— Attempt **FIVE** questions in all by selecting **ONE** question from each unit. Section-A is compulsory. All questions carry equal marks.

SECTION—A

1. Compulsory Question :

Explain briefly :

(1) What is reverse transcriptase and its role ?

(2) Difference between lytic and lysogeny.

(3) Difference between cosmid and phagemid.

(4) What is a shuttle vector ?

(5) What is gel retardation ?

(6) Why is Northern hybridization done ?

(7) What are affinity tags ?

(8) Role of promoters in cloning. 2×8

UNIT—I

2. (a) Define Genetic Engineering. Broadly discuss the scope and need of genetic engineering and gene cloning. 6

   (b) What are restriction endonucleases ? Mention their types and specific features. 6

   (c) Discuss the different criteria for designing primers for PCR amplification of a gene. 4

3. (a) Mention the principle and key concepts of PCR. Discuss the various types of PCR. 8

   (b) Discuss the basic features of a plasmid. How is a plasmid converted into a cloning vector ? 8

UNIT—II

4. (a) What are cloning vectors ? Mention the various types of plasmid vectors and their specific features. 6

   (b) What do you understand by insertional activation and how is it related to blue/white selection of clones ? 4

   (c) What are Artificial Chromosomes and why are they called high capacity vectors ? Describe the BAC and how it is different from YAC. 6

5. (a) How is genomic library created and discuss the screening methods of clones from genomic library ? 8

   (b) Describe what is DD PCR and how is it different from conventional PCR ? Mention its application. 8

UNIT—III

6. (a) What is primer extension and why is it used ? Mention with reason whether this can be used as an alternative to SI nuclease mapping ? 8

   (b) What are entrapment vectors and their uses ? How is transposon tagging carried out in *Drosophila melanogaster* ? 8

7. (a) How are protein interactions studied using yeast two-hybrid system ? 8

   (b) Explain in detail how proteins can be analyzed by PCR based site directed mutagenesis. 8

UNIT—IV

8. (a) What are expression vectors ? What is the role of specific promoters in these vectors ? 6

   (b) Discuss the general problems in expression of proteins in E.coli. 6

   (c) What is T7 expression system ? 4

9. (a) Discuss the CUP1 expression system in Yeast and mention how it is different from GAL system of expression. 8

   (b) How are knockout mouse created by homologous and site specific recombination ? 8