This question paper contains **3** printed pages]

Roll No. | | | | | | | | | | |

S. No. of Question Paper : **5562**

Unique Paper Code : **2492013603**

Name of the Paper : **Fundamentals of Recombinant DNA Technology**

Name of the Course : **B.Sc. (Hons.) Biochemistry (NEP)**

Semester : **VI**

Duration : **2 Hours** Maximum Marks : **60**

(Write your Roll No. on the top immediately on receipt of this question paper.)

There *are* **6** questions.

Attempt any *four* questions.

All questions carry equal marks.

Question No. **1** is compulsory.

1. (A) Write the contributions of the following :

   (*i*) Kary Mullis

   (*ii*) Paul Berg

   (*iii*) Bolivar and Rodriguez.

   (B) State True/False and justify (any *six*) :

   (*i*) Hybrid promoters are preferred for expression vectors.

   (*ii*) Blunt ends increase the efficiency of ligation.

   (*iii*) All three types of restriction endonucleases are useful in genetic engineering.

P.T.O.

(*iv*) Factor VIII cannot be expressed in *E. coli*.

(*v*) Bacterial cells are naturally competent.

(*vi*) Lambda replacement vectors are used to make genomic libraries.

(*vii*) Any *E. coli* strain can be used for recombinant DNA technology.

(3,12)

2. Differentiate between the following :

(*i*) Real time PCR and Multiplex PCR

(*ii*) Genomic and cDNA library

(*iii*) Linker and Adapter

(*iv*) pUC18 and Ti-Plasmid

(*v*) YAC and BAC. (15)

3. (A) 200 DNA molecules were used as a template in a PCR reaction. Calculate the number of amplicons produced after 30 cycles.

(B) What are the uses of the following in genetic engineering ? Explain with the help of a diagram :

(*i*) BAL31

(*ii*) T4 Polynucleotide Kinase

(*iii*) Alkaline Phosphatase

(*iv*) EcoRI

(*v*) S1 Nuclease

(*vi*) DNA ligase. (3,12)

4. (A) What are the different classes of viral vectors ? Discuss their advantages and disadvantages in genetic engineering.

(B) Describe the principle of Sanger's method of DNA sequencing. List *two* limitations of Sanger's method.

(C) What are the essential features of a typical expression vector ? Give *two* examples. (6,4,5)

5. (A) Discuss the factors that affect the efficiency of a PCR reaction.

(B) Briefly explain *two* methods of DNA uptake by cells.

(C) Draw a labelled diagram of pGEM3Z vector. How is it different from pBR322 cloning vector ? (5,5,5)

6. Write short notes on the following (any *five*) : (15)

(*i*) Pyrosequencing

(*ii*) Site directed mutagenesis

(*iii*) Homopolymer Tailing

(*iv*) Colony Hybridization

(*v*) Fusion tags and their role in purification of recombinant proteins

(*vi*) Blue-White Selection.