[This question paper contains 3 printed pages.]

**Sr. No. of Question Paper : 1046** **E** **Your Roll No.....**

Unique Paper Code : 249603

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

Name of the Paper : Recombinant DNA Technology (BCHT-612)

Semester : VI

Duration : 3 Hours Maximum Marks : 75

**Instructions for Candidates**

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **five** questions in all including Q. No. 1 which is compulsory.

1. (a) State True or False. Justify the statement.

   (i) M13 Phage is useful for sequencing work.

   (ii) Restriction Endonucleases type II are used for cloning experiments.

   (iii) Multiple Cloning Sites are produced by adding linkers to vectors.

   (iv) Alkaline Phosphatase treatment of a cleaved plasmid is done before ligation.

   (v) Chromosome Walking is used in the sequencing of large fragments of DNA.

   (vi) DNA Polymerase I is required for nick translation. (1.5×6)

   (b) Write the use of the following enzymes:

   (i) Polynucleotide Kinase

   (ii) Klenow fragment

   (iii) T4 DNA Ligase

*P.T.O.*

(iv) Reverse Transcriptase

(v) Taq Polymerase (2×5)

2. (a) What methods can he employed to generate specific changes in cloned DNA?

(b) What are shuttle vectors? Write their utility in recombinant DNA Technology.

(c) What is dideoxy chain termination reaction? (3,4,7)

3. (a) Differentiate between:

(i) Colony and Plaque

(ii) PCR and RT-PCR

(iii) Plasmids and Cosmids

(b) A linear DNA is digested with Eco RI and HindIII separately and then in combination. The following fragments are observed on the gel. Use this information to make a restriction map

| | | | | | |
|---|---|---|---|---|---|
| EcoRI | 8.5 Kb | 5.0 Kb | 3.0 Kb | | |
| HindIII | 9.5 Kb | 6.0 Kb | 1.0 Kb | | |
| EcoRI and HindIII | 6.0 Kb | 4.0 Kb | 3.0 Kb | 2.5 Kb | 1.0 Kb |

(9,5)

4. (a) How are RFLPs generated? State their use in forensics.

(b) Write the principle of blue-white selection assay.

(c) What do you understand by gene knockout and knockdown? (6,4,4)

5. (a) State the differences between λ phage and plasmid libraries

(b) Discuss the method involved in the production of growth hormone.

(c) Describe the strategy used for the solid phase synthesis of DNA. (6,4,4)

6. (a) What is the use of anti-sense RNA? How does it act in suppressing the action of RNA?

   (b) What are the applications of genetic engineering?

   (c) How do bacteria protect themselves from the restriction endonucleases present in the cell? (6,4,4)

7. (a) Explain with the help of an example, what is sequence independent library screening.

   (b) Write a short note on the Human Genome Project and its impact.

   (c) Write the advantages and disadvantages of cDNA and genomic libraries. (6,4,4)

8. Write short notes:

   (i) Bacterial Artificial Chromosomes

   (ii) Northern Blotting

   (iii) Shot gun sequencing (5,4,5)