(b) What are pUC vectors? Explain with the help of a diagram and illustrate how they are different from cosmids. (8)

5. (a) Write short notes on : (3×3=9)

(i) Nomenclature of restriction enzymes

(ii) Primer designing

(iii) Transformation

(b) Give schematic of the following techniques (**any three**) : (3×3=9)

(i) Agarose gel electrophoresis

(ii) Immunoblotting

(iii) Genomic library

(iv) Nucleic acid hybridization

6. (a) Illustrate the role of antibiotics in the selection of transformed bacterial cells. (8)

(b) What is DNA profiling? How is it used in paternity testing? (10)

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 3500 **I**

Unique Paper Code : 3184001001

Name of the Paper : Concepts in Biotechnology

Name of the Course : **B.Sc. (H) Biomedical Sciences : Generic Elective (NEP)**

Semester : I

Duration : 3 Hours Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **5** questions in total including.
3. Q. No. **1** which is compulsory.
4. Subparts of the questions should be attempted together.

1. (a) Define the following (**any six**) : (6×2=12)

(i) Annealing

(ii) Electrophoresis

(iii) Tm

(iv) Recombinant DNA

(v) DNase

(vi) UV crosslinking

(vii) Palindromic sequence

(b) Fill up the blanks (**any six**) : (6)

(i) _____ produces sticky ends.

(ii) Pores in an agarose gel are created due to _____.

(iii) _____ is used to estimate the size of an unknown DNA fragment on an agarose gel.

(iv) _____ is a commonly used radioactive element for making radiolabelled probes.

(v) The denaturation step of PCR takes place at _____.

(vi) Plasmids generally exist in a _____ form within the bacterial cell.

(vii) GMO stands for _____.

2. (a) Differentiate between the following (**any three**) : (4×3=12)

(i) Blunt end and directional cloning

(ii) Stacking gel and Resolving gel

(iii) T4 and *E.coli* DNA ligase

(iv) Prokaryotic and Eukaryotic expression vectors

(b) Explain the components used in plasmid isolation and their uses. (6)

3. (a) Why is PAGE called as discontinuous gel electrophoresis? Enumerate the components used in PAGE and the principle of separation. (9)

(b) Explain any two variations of the conventional PCR and their application. (9)

4. (a) How would you sequence a DNA fragment having base composition of 5' GGATACTACGCTC 3' by Sanger's sequencing method. Show the picture of the gel obtained during the sequencing of this fragment. (10)