(b) Draw a well-labelled diagram of the pUC vector. What are its important components? (5)

5. (a) Briefly explain any two applications of Biotechnology. (5×3=15)

(b) What are the different criteria kept in mind while designing a primer?

(c) List all the important components used in PCR. State the significance of each component.

6. (a) Give a schematic representation to explain plasmid DNA isolation. (5×3=15)

(b) Give a schematic diagram to explain *'In vitro* packaging' of lambda bacteriophage.

(c) State the difference between genomic and cDNA library.

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 6032 **H**

Unique Paper Code : 3184001001

Name of the Paper : Concepts in Biotechnology

Name of the Course : **B.Sc. (H) Biomedical Science (UGCF)**

Semester : II

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 **five** questions in all.
3. Question no. **1** is compulsory.
4. Attempt subparts of a question together.
5. Give illustrations and examples wherever required.

1. (a) Define the following (**any seven**) : (2×7=14)

(i) Linker

(ii) Primer

(iii) Isoschizomers

(iv) Tracking Dye

(v) Ethidium Bromide

(vi) Nucleotide

(vii) DNA Ligase

(viii) Transformation

(b) Differentiate between the following (**any three**) : (4×3=12)

(i) Reverse Transcription PCR and Inverse PCR.

(ii) Type I and Type II Restriction Enzymes.

(iii) Plasmid and Cosmid.

(iv) Colony and Plaque Hybridization.

(c) State True or False. Justify your answer (**any two**). (2×2=4)

(i) Proteins are resolved on the basis of their charge in SDS PAGE.

(ii) T4 DNA ligase requires NAD + as a cofactor to catalyse phosphodiester bondformation during the polymerisation process.

(iii) In blue-white screening, the white colonies represent the cells that have not taken up the recombinant plasmid vector.

2. Give the principle, methodology and application of the following techniques with the help of appropriate diagrams (**any three**) : (5×3=15)

(a) Immunoblotting

(b) Sanger's Sequencing

(c) Agarose gel electrophoresis

(d) Southern Hybridisation

3. Write Short Notes on the following: (5×3=15)

(a) Blunt end Ligation

(b) GMOs

(c) Challenges encountered while using *E. coli* as the host for recombinant protein synthesis.

4. (a) Give a brief account on the following : (5×2=10)

(i) Native PAGE

(ii) Lambda Phage Derived Replacement and Insertion Vectors