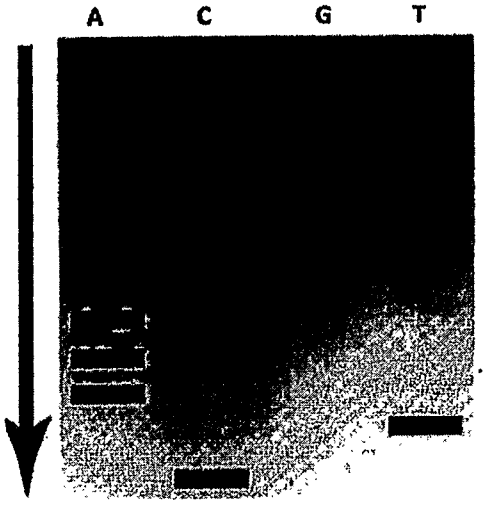
5. (a) What polyacrylamide gel electrophoresis. Explain the process in detail and elaborate the function of each chemical used in its preparation. (9)

   (b) What is southern hybridization? Explain in details the steps involved in southern hybridization. (9)

6. (a) The autoradiogram obtained after sequencing of a template strand is shown below. Elaborate in detail the method that has been used for sequencing. Also give the sequence of the template strand explaining how you obtained it. (9)



   (b) Explain in detail the process of RT-PCR and give its applications (9)

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 4617 **J**

Unique Paper Code : 3184001001

Name of the Paper : Concepts in Biotechnology

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

Semester : II/IV

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. Give illustration and examples wherever required.
5. Subparts of the questions should be attempted together.

1. (a) Define the following (any 5) (2x5=10)

   (i) Autoradiography

(ii) Dideoxy nucleotide

(iii) Tm (Melting temperature)

(iv) Linkers

(v) Homopolymer tailing

(vi) Transfection

(b) State True or False and justify (any four)(4x2=8)

(i) Plasmids are always essential for bacterial survival.

(ii) Agarose gel electrophoresis separates DNA fragments on the basis of their charge.

(iii) Restriction enzymes are naturally found in bacteria and viruses

(iv) Genomic libraries only contain coding sequences of genes

(v) Vectors can only be used in prokaryotic cells like bacteria.

2. (a) Differentiate between the following: (any 3) (3x3=9)

(i) Insertional and Replacement vector

(ii) Gelling agent used in AGE and PAGE

(iii) Blunt end ligation and sticky end ligation

(iv) Germline vs Somatic cell gene therapy

(b) Write short notes on (any 3) (3x3=9)

(i) Live recombinant virus vaccine

(ii) DNA profiling

(iii) Plaque hybridization

(iv) GMO

3. (a)Describe the process for production of biopharmaceutical protein using recombinant DNA technology. (6)

(b) What is a genomic DNA library? How is it different from a cDNA library? (6)

(c) What is a vector? Draw any mammalian expression vector and explain the function of its component? (6)

4. (a) How is a plasmid different from cosmid in terms of its structure and function? (6)

(b) Explain any two strategies that are used to detect a cloned target gene within a library in E. coli. (6)

(b) Plasmid pRIT452 was cut with PstI and HindIII. From the data below, determine the restriction map of the plasmid. (6)

*Pst*I	6.8	5.9		
*Hind*III	6.5	6.2		
*Pst*I + *Hind*III	4.8	4.2	2.0	1.7

P.T.O.