[This question paper contains 2 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 9263 **J**

Unique Paper Code : 2533012004

Name of the Paper : Biotechniques and Instrumentation

Name of the Course : **Microbiology**

Semester : IV – Part II

Duration : 2 Hours Maximum Marks : 60

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **five** questions.
3. **All** questions carry equal marks.

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

   (a) Resolving power

   (b) Sedimentation coefficient

   (c) Centrifugal force

   (d) Chromatogram

   (e) Analyte

   (f) Retention time

   (g) Partition Coefficient

2. Differentiate between the following : **(any two)** (2×6=12)

   (a) Scanning electron microscopy and Transmission electron microscopy

P.T.O.

(b) Differential centrifugation and Density gradient centrifugation

(c) SDS PAGE and Native PAGE

3. Write the principle and application of the following techniques : **(any two)** (2×6=12)

(a) Gel filtration chromatography

(b) Circular dichroism

(c) UV-Visual spectrophotometry

4. Write short note on the following : **(any two)** (2×6=12)

(a) Cryo-electron microscopy

(b) HPLC

(c) Confocal microscopy ...

5. (a) Diagrammatically explain the importance of annular diaphragm and phase plate in phase contrast microscopy. List any two applications of the technique. (4+2=6)

(b) How Fluorescent microscopy is important for biological molecules. Discuss its disadvantages. (3+3=6)

6. (a) Discuss the principle and working of Ion exchange chromatography. How it is different from Affinity chromatography. (5+3=8)

(b) What is Rf value? Justify the statement "Rf value indicates solubility of a solute in a solvent". (2+2=4)