Progressive Education Society's
Modern College of Arts, Science & Commerce Ganeshkhind, Pune – 16
(Autonomous)
End Semester Examination: Nov./Dec. 2023
Faculty: Science and Technology

Program: B.Sc. Biotech (04) **Semester: III** **SET: B**
Program (Specific): Biotechnology **Course Type: Core**
Class: S. Y. B.Sc. **Max. Marks: 35**
Name of the Course: Bio-analytical Techniques
Course Code: 23 BBT-306 **Time: 2 Hr**

Instructions to the candidate:

1) ***There are 4 sections in the question paper. Write each section on separate page.***
2) ***All Sections are compulsory.***
3) ***Figures to the right indicate full marks.***
4) ***Draw a well labelled diagram wherever necessary.***

SECTION: A

Q1) Answer the following (Attempt any 5/6) **5**

1. Give the unit of absorbance.
2. What does "HPLC" stand for?
3. Write about transmittance in the context of spectroscopy.
4. Describe the basic principle of UV-Visible spectrometry.
5. What is λmax for DNA and RNA molecules?
6. Define "partition chromatography" in one sentence.

SECTION: B

Q2) Answer the following (Attempt any 5/6) **10**

1. Define the term "molar extinction coefficient." What information does it provide about a chemical compound's behavior in UV-Visible spectroscopy?
2. Differentiate between UV spectrometers and Visible spectrometers
3. What are planar chromatography and column chromatography? Give the examples of applications.
4. Define sedimentation equilibrium.
5. Explain the principle of Mass spectroscopy?
6. What does the term "loading buffer" refer to in gel electrophoresis?

[P.T.O.]

SECTION: C

Q3) Answer the following (Attempt any 2/4) 8

1. Write the principle of TLC & mention its applications.
2. Explain the relationship between transmittance and absorbance.
3. 80.0 grams of glucose ($C_6H_{12}O_6$, mol. wt = 180. g/mol) is dissolved in enough water to make 1.00 L of solution. What is its molarity?
4. Comment on applications of SDS-PAGE.

SECTION: D

Q4) Answer the following (Attempt any 2/4) 12

1. "Voltage and current are the main factors that affect electrophoresis." Explain.
2. Discuss in detail preparative and analytical centrifugation using diagram.
3. Distinguish between Agarose gel electrophoresis and Native PAGE using diagram.
4. "Centrifugation aids in the separation of biological molecules, such as proteins, nucleic acids, and organelles." Justify.