

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 1389

I

Unique Paper Code : 2492011103

Name of the Paper : Biochemical Techniques

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

Semester : I

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. There are 6 questions.
3. Attempt any 4 questions.
4. All questions carry equal marks. Question no. 1 is compulsory.

1. (a) Justify the following :

(i) Glass cuvettes are not used to measure absorbance of DNA solutions.

P.T.O.

- (ii) A denser particle will have a higher sedimentation coefficient.
 - (iii) All fluorescence compounds have cyclic structures.
 - (iv) Why can the molecular weight of proteins not be estimated by Native-gel electrophoresis but can be calculated by SDS-PAGE?
 - (v) A spacer arm is interposed between ligand and the matrix in affinity chromatography.
 - (vi) Electrophoresis cannot be used for separation of lipids.
- (b) The absorbance of a $12 \times 10^{-5} \text{ M}$ solution at a wavelength of 280 nm is 0.5. The pathlength of the cuvette is 1 cm. Calculate the molar extinction coefficient. (12,3)

2. (a) Define the following :

- (i) Void volume
- (ii) Partition coefficient
- (iii) Exclusion limit
- (iv) Chromophore

- (v) Molar extinction coefficient
 - (vi) Stoke's shift
 - (vii) Retention factor
 - (b) Derive Beer-Lambert's Law and discuss its limitations.
 - (c) Describe the different types of rotors used for centrifugation. (7,5,3)
3. Mention the role of the following in SDS-PAGE :
- (a) SDS in the sample buffer
 - (b) β -mercaptoethanol
 - (c) TEMED
 - (d) Ammonium persulphate
 - (e) Coomassie Brilliant Blue
 - (f) Separating gel
 - (g) Bromophenol blue
 - (h) Glycerol
 - (i) Glycine

(j) Tris buffer (15)

4. Differentiate between the following pairs :

- (a) Cation and anion exchangers
- (b) Fixed angle and swinging bucket rotors
- (c) Paper and thin layer chromatography
- (d) Extrinsic and intrinsic fluorophores
- (e) Isopycnic and rate zonal gradient centrifugation (15)

5. (a) Describe the principle and applications of affinity chromatography.

(b) Explain the working of a double beam spectrophotometer with the help of a diagram.

(c) Write the principle of ion-exchange chromatography and write two applications of this technique.

(5,5,5)

6. (a) What are the properties of good matrix used in chromatography? Write two examples of matrices used in gel filtration chromatography.

(b) Elaborate the principle of isoelectric focusing technique.

(c) Explain the principle of agarose electrophoresis and cite two examples of its applications.

((200))