This question paper contains 2 printed pages. *Your Roll No. .....*

Sl. No. of Ques. Paper : 2087 **GC-3**

Unique Paper Code : **32493902**

Name of Paper : **Protein Purification Techniques (SEC-2)**

Name of Course : **B.Sc. (Hons.) Bio-Chemistry (CBCS) Skill Enhancement Course**

Semester : **III**

Duration : **2 hours**

Maximum Marks : **50**

(Write your Roll No. on the top immediately on receipt of this question paper.)

All questions are compulsory. Subparts of the questions should be attempted together.
Use of Scientific calculator / log tables may be allowed.

1. (i) Explain briefly:

   (a) Nucleic acids can be purified using affinity chromatography.

   (b) Potassium salts are not suitable for salting out.

   (c) Native gel electrophoresis cannot be used to estimate the molecular weights of proteins.

   (d) If a protein is more stable above its pI then an anion exchanger is used for its purification.

   (e) Samples are boiled in SDS and β-mercaptoethanol before loading onto SDS-PAGE gel.

   (f) Agarose gels are used for separating large DNA molecules.

   (g) Sephadex G-125 is not suitable to separate proteins.

   (ii) Answer the following in one or two words:

   (a) A technique to determine the molecular weight of a protein

   (b) A molecule used to determine the void volume

   (c) An example of a cation exchanger

   (d) A technique to separate amino acids from potein

   (e) A dye used to track the electrophoresis

   (f) A group specific ligand. 14,6

2. (i) What do you understand by the following?

   (a) Exclusion limit of a gel

   (b) Binding capacity of an ion exchanger

P. T. O.

(c) Elution volume

(d) Sensitivity of an assay

(e) Specific activity of an enzyme.

(ii) Name a suitable ligand for purifying the following proteins using affinity chromatography:

(a) Insulin Receptor

(b) Carboxylase Enzyme

(c) Kinase

(d) Glycoprotein

(e) Lactate Dehydrogenase. 10,5

3. (i) During separation of proteins using Ion-Exchange Chromatography, indicate the importance of the following:

(a) pH of the buffer

(b) Increasing salt concentration in the eluent.

(ii) Differentiate the following:

(a) Native and SDS-PAGE

(b) Sephadex G-50 and G-200

(iii) Explain the role of the following:

(a) Spacer arm in affinity chromatography

(b) Equilibration in Ion-Exchange chromatography

(c) Stacking gel in electrophoresis

(d) Glycerol in loading dye

(e) Bromophenol blue in the sample buffer. 5,5,5