AS–1390

**B.Sc. (Part–I) Semester–II Examination**

**BIOCHEMISTRY**

**(Biophysical and Biochemical Techniques)**

Time : Three Hours] [Maximum Marks : 80

**N.B.** :– **All** questions are compulsory and carry equal marks except question No. **1** which carries **8** marks.

1. (A) Fill in the blanks :

(i) Dialysis is used for removing _____ from proteins.

(ii) The pH at which equal number of positive and negative charges are present on the molecules is known as _____.

(iii) The atoms having the same atomic number different atomic weights are known as _____.

(iv) Solution of mixed indicators having a number of colour changes over a wide range of pH are called _____ indicators. 2

(B) Choose correct alternative to complete sentences :

(i) Henderson-Hasselbalche equation is used in determing the pH of :

(a) Weak acid (b) Salt

(c) Buffer (d) None of the above

(ii) Molecular weight of protein can be known by performing :

(a) PAGE (b) SDS-PAGE

(c) 2-D Electrophoresis (d) None of the above

(iii) The chief buffer system in blood :

(a) $K_2HPO_4/KH_2PO_4$ (b) B.Protein/H.Protein

(c) $NaHCO_3/H_2CO_3$ (d) B.Hb/H.Hb

(iv) The number of high energy phosphate contained by ATP is :

(a) 1 (b) 2

(c) 3 (d) None of the above 2

(C) Answer in **one** sentence :

(i) What is dialysis ?

(ii) What is passive transport ?

(iii) What is sedimentation velocity ?

(iv) What is isoelectric point ? 4

2. What do you mean by Redox Potentials ? Derive relation between standard redox potentials and Free Energy Change. 12

**OR**

What do you understand by Standard Free Energy ? How is $\Delta G$ of reaction determined ? Give relation between equilibrium constant and standard free energy change. 12

3. Describe the following :

(a) Weak acids and bases. 4

(b) Measurement of pH. 4

(c) Fluid Mosaic Model. 4

**OR**

(p) Active and passive transport. 4

(q) Donnan membrane equilibrium. 4

(r) Functions of bimembranes. 4

4. Give general principles and application of :

(a) Paper chromatography. 4

(b) Thin layer chromatography. 4

(c) Gel filtration. 4

**OR**

(p) Ion Exchange chromatography. 4

(q) Affinity chromatography. 4

(r) Gas Liquid Chromatography. 4

5. Give basic principles of paper and agarose electrophoresis with their importance. 12

**OR**

What is meant by 2D electrophoresis ? Give its principle and importance. Add a note on isoelectric focussing. 12

6. Explain principle and application of following :

(a) Colorimeter 4

(b) Flame Photometer 4

(c) Flurometer. 4

**OR**

(p) NMR 4

(q) ESR 4

(r) Mass Spectrophotometry. 4

7. Describe the following :

(a) ELISA 4

(b) RIA 4

(c) PCR 4

**OR**

(p) Biological hazards of radiations 4

(q) Isotopic tracer technique 4

(r) Autoradiography. 4