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

2S : BIOCHEMISTRY

(Biophysical and Biochemical Techniques)

Time : Three Hours] [Maximum Marks : 80

Note :— All questions are compulsory and carry equal marks except Question No. **1** which carries **8** marks.

1. (A) Fill in the blanks :— 2

(i) RIA stands for _____.

(ii) Movement of ions or molecules from a region of high concentration to low concentration is known as _____.

(iii) Technique used for separation of protein on the basis of molecular weight is _____.

(iv) Negative logarithm of hydrogen ion concentration is _____.

(B) Choose the correct alternative :— 2

(i) Oxidation is defined as :

(a) Addition of oxygen (b) Loss of hydrogen

(c) Loss of electron (d) All of the above

(ii) Ion exchange chromatography is based on :

(a) Electrostatic attraction (b) Affinity

(c) Adsorption (d) Partition

(iii) A solution which resists sudden change in pH is known as :

(a) Buffer (b) Standard

(c) Acidic (d) Basic

(iv) In spontaneous reactions value of ΔG is :

(a) Negative (b) Positive

(c) Zero (d) None of the above

(C) Answer in **ONE** sentence :— 4

(i) Define redox potential.

(ii) Define dialysis.

(iii) Define Spontaneous reaction.

(iv) Define Beer's Lambert Law.

2. (A) Describe first and second law of thermodynamics. 4

(B) Describe application of Gibbs free energy change in Biochemistry. 4

(C) Explain standard free energy change in coupled reactions. 4

OR

(P) Describe various thermodynamics systems. 4

(Q) Explain relation between standard redox potential and free energy change. 4

(R) Explain the concept of Entropy. 4

3. (A) Explain application of dialysis in Biochemistry. 4

(B) Describe measurement of pH by indicators. 4

(C) Comment on preparative ultracentrifugation. 4

OR

(P) Explain the concept of pH and buffers. 4

(Q) Describe Handerson-Hasselbalch equation. 4

(R) Explain active and passive transport. 4

4. Describe principle of :

(A) Ion exchange chromatography. 4

(B) Paper chromatography. 4

(C) Molecular sieve chromatography. 4

OR

Explain applications of :

(P) Ion exchange chromatography. 4

(Q) Gas liquid chromatography. 4

(R) HPLC. 4

5. Describe in detail Western blotting. 12

OR

Describe in detail SDS-PAGE and isoelectric focusing. 12

6. (A) Describe Beer Lambert's Law. 4

(B) Describe Principle of fluorometry. 4

(C) Explain principle of mass spectroscopy. 4

OR

(P) Describe applications of NMR. 4

(Q) Describe principle of ESR. 4

(R) Write in brief about flame photometry. 4

7. Explain in detail with suitable diagram principle and application of ELISA. 12

OR

Explain in detail isotopic tracer techniques and add a note on autoradiography. 12