

**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  $\Delta G$  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