647510 **0301112C1010** **Seat No :_____**

B.Sc. Semester - 1 (*CBCS*) Examination
Nov/Dec - 2022 (OLD COURSE)
BIO-CHEMISTRY(CORE)

Time: 2:30 Hours **Marks: 70**

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

Q-1

A. Answer the following (any one out of two) **(07)**

1. Explain Water as a biological solvent, physical and chemical properties of water, importance of water for living organisms.
2. What are Chemical Bonds? Enlist types and their definition, explain any one in detail and their importance in structure of biomolecules.

B. Attempt Any one (any one out of two) **(04)**

1. Discuss concept of atoms and molecules.
2. Explain Dipole moment and molecular structure.

C. Attempt Any three (any three out of five) **(03)**

1. Define electrophiles.
2. Define Nucleophiles.
3. Comment on Van der Waals forces
4. Give one difference between polar & nonpolar bond.
5. Define Molecule and give one example of it.

Q-2

A. Answer the following (any one out of two) **(07)**

1. Write a note on Biochemical equation-oxidation reduction reaction-redox potential and its role in the biological reaction.
2. Discuss the second law of thermodynamics with an example.

B. Attempt Anyone (any one out of two) **(04)**

1. Discuss ATP as universal energy in living organisms.
2. Give the significance of thermodynamics property with example.

C. Attempt Any three (any three out of five) **(03)**

1. State first law of thermodynamics.
2. What do you mean by Redox reaction?
3. What is isothermal process?
4. Define: Gibbs free energy.
5. Give 2 examples of High-energy compounds.

Q-3

A. Answer the following (any one out of two) **(07)**

1. Explain the shape of titration curve of strong acid and strong base.
2. Write a detailed note on the pH meter. Write the role of bicarbonate, as a physiological buffer.

B. Attempt Anyone (any one out of two) **(04)**

1. Write a brief note on Henderson– Hesselbalch equation.
2. Write about the dissociation constant of acid and base.

C. Attempt Any three (any three out of five) **(03)**

1. Define Arrhenius acid and base.
2. Define buffer. Give 2 examples.
3. Comment on the term pH and pOH.
4. What do you mean by pKa value?
5. Define dissociation constant.

Q-4

A. Answer the following (any one out of two) **(07)**

1. Explain the term diffusion. Write the importance of diffusion in living systems.
2. Define the term viscosity. Discuss the factors affecting on viscosity.

B. Attempt Anyone (any one out of two) **(04)**

1. Discuss the importance and applications of adsorption.
2. What is osmosis? Write the types and application of osmosis.

C. Attempt Any three (any three out of five) **(03)**

1. If Red Blood Cell are suspended in hypertonic solution of Na Cl, water flows out of RBC and the cytoplasm shrinks, this phenomenon referred to as ____
2. What do you mean by diffusion?
3. Define: adsorption.
4. Write one application of diffusion.
5. What is viscometer?

Q-5

A. Answer the following (any one out of two) **(07)**

1. Give the formula for Normal, Molar, and Molal solution and prepare 2 Molar, 1.5 Normal and 1 Molal solution of NaOH (M. W. 40).
2. Explain the concept of density and specific gravity. Solve the below problems.
   (a) If 5 ml of ethanol has a mass of 3.9 gm, what is the density?
   (b) If the density of mercury is 13600 kg/m^3, find the specific gravity of mercury.

B. Attempt Anyone (any one out of two) **(04)**

1. a. Define the terms: Stock solution & Working solution.
   b. Explain the Percent solution and its preparation of 110 ml of 40% Glucose (M.W. 180.156) solution.
2. Define solution and state factors affecting solution formation.

C. Attempt Any three (any three out of five) **(03)**

1. Define Equivalent Weight.
2. Define Mole.
3. Define Normality.
4. Define Molarity.
5. Define Solubility.

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