**647510** **BSCbicCC1010** **Seat No :_____**

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

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

**Instructions:**

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

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**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 Anyone (any one out of two)** **(04)**

1. Comment on bond energy and atom.
2. Discuss Weak chemical forces-hydrogen bonds, inter and intramolecular hydrogen bonds and effects of hydrogen bonding.

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

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

**Q-2**

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

1. Discuss Biochemical equation-oxidation reduction reaction-redox potential and its role in biological reaction.
2. Explain the second law of thermodynamics.

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

1. Give the significance of thermodynamics property with an example.
2. Write notes on ATP.

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

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

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

1. Define buffer. Give 2 examples.
2. Comment on the term pH and pOH.
3. Define Arrhenius acid and base.
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. Discuss about diffusion. Write importance of diffusion in living systems.
2. Define the term viscosity. Explain factors affecting 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 applications of osmosis.

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

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

**Q-5**

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

1. Give the formula for Normal, Molar, and Molal solution and prepare 4 Molar, 2 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 compound M has a mass of 44 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. Define solution and state factors affecting solution formation.
2. a. Define the terms: Stock solution & Working solution.
   b. Explain: Percent solution and its preparation of 1000 ml of 40% Glucose (M.W. 180.156) solution.

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

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

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