

B.Sc. Semester - 1 (CBCS) Examination
Oct/Nov. -2019 (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 Write the correct answer for the questions [4 marks]**
1. Briefly write about nucleophiles.
 2. Write the relationship between bond length and bond energy.
 3. Give the definition of Electronegativity.
 4. Define isotopes and write one example
- Q.1 B Write the Answer in Brief. (Any 1 out of 2)..... [2 marks]**
1. Which amino acids participate in the formation of disulfide bond?
 2. Write about any two properties of water.
- Q.1 C Write the Answer in detail. (Any 1 out of 2)..... [3 marks]**
1. Explain co ordinate covalent bond with suitable diagram.
 2. Explain non polar interactions with suitable examples.
- Q.1 D Write the Short note in detail. (Any 1 out of 2)..... [5 marks]**
1. Write a note on: Ionic bonds.
 2. Write the significance of secondary bonds in biological systems.
- Q.2 A Write the correct answer for the questions [4 marks]**
1. Define term in relation to thermodynamics: Gibb's free energy.
 2. Define the term: Open System.
 3. What is the meaning of entropy?
 4. Define: Relative affinity of electron.
- Q.2 B Write the Answer in Brief. (Any 1 out of 2)..... [2 marks]**
1. Explain the significance of ΔG in biochemical reactions.
 2. Draw the structure of ADP.
- Q.2 C Write the Answer in detail. (Any 1 out of 2)..... [3 marks]**
1. Write a note: Coupled Reactions
 2. Give the significance of thermodynamics property with example.
- Q.2 D Write the Short note in detail. (Any 1 out of 2)..... [5 marks]**
1. Explain Second Law of thermodynamics.
 2. Explain Redox Potential in detail.
- Q.3 A Write the correct answer for the questions [4 marks]**
1. Draw pH scale.
 2. Write the use of titration curve of acid/base.
 3. Write Nernst equation.
 4. What happens when acid and base mix together?
- Q.3 B Write the Answer in Brief. (Any 1 out of 2)..... [2 marks]**
1. Calculate the pH of 0.005 M H_2SO_4 solution.
 2. Explain the differences between strong and weak acids.
- Q.3 C Write the Answer in detail. (Any 1 out of 2)..... [3 marks]**
1. Calculate the molarity of water.
 2. Derive an equation to determine concentration of hydrogen ion in acetic acid.

- Q.3 D Write the Short note in detail. (Any 1 out of 2)..... [5 marks]**
1. Derive Henderson Hasselbalch equation by taking H_2CO_3 as an example.
 2. Explain in detail: Phosphate buffer.
- Q.4 A Write the correct answer for the questions [4 marks]**
1. What is the use of viscometer?
 2. Why polar molecule cannot easily cross the plasma membrane?
 3. Define the term: Adsorption.
 4. Write significance of diffusion in transport of gases.
- Q.4 B Write the Answer in Brief. (Any 1 out of 2)..... [2 marks]**
1. 'Change in temperature can affect the viscosity of solution'. Justify the statement.
 2. What is the effect of temperature on Physical and chemical adsorption?
- Q.4 C Write the Answer in detail. (Any 1 out of 2)..... [3 marks]**
1. Define the term: osmolarity and explain the significance of osmosis.
 2. Explain the effect of temperature on diffusion, osmosis and viscosity.
- Q.4 D Write the Short note in detail. (Any 1 out of 2)..... [5 marks]**
1. Discuss importance and applications of adsorption.
 2. Explain the importance of diffusion in biological system.
- Q.5 A Write the correct answer for the questions [4 marks]**
1. How one can prepare 1gm% NaCl solution?
 2. Define the term: Mole .
 3. What do you understand by 2 : 10 dilution?
 4. Define: Equivalent weight.
- Q.5 B Write the Answer in Brief. (Any 1 out of 2)..... [2 marks]**
1. Define the terms: Stock solution and Working solution.
 2. Write the formula to calculate normality and molarity of the solution.
- Q.5 C Write the Answer in detail. (Any 1 out of 2)..... [3 marks]**
1. Prepare 0.02 M, 100 ml solution of glucose ($\text{C}_6\text{H}_{12}\text{O}_6$)
 2. Calculate the equivalent weight of CaCl_2 and prepare 0.1 N CaCl_2 (M.Wt.-111) solution.
- Q.5 D Write the Short note in detail. (Any 1 out of 2)..... [5 marks]**
1. Calculate the number of moles and molarity of 50 mL solution of 18 gm% of glucose solution.
 2. Prepare 200 ml of 10 mM solution of glucose from 5 gm% (w/v) fructose solution.
