

B.Sc. Semester - 1 (CBCS) Examination
Oct/Nov. -2019 (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)..... (07)**
1. Classify the covalent bonds and explain any two types with diagram.
 2. Explain the physiological importance of various weak interactions.
- Q.1(b) Attempt the following question (Any one)..... (04)**
1. Write a note on hydrogen bond formation.
 2. Briefly explain the any four properties of water.
- Q.1 (c) Attempt any three..... (03)**
1. Define: electronegativity.
 2. What is bond energy? Give its unit.
 3. Define the term: Hydrophobic compound.
 4. Write two examples of electrophiles.
 5. Write the use of radio isotopes.
- Q. 2 (a) Answer the following. (Any one)..... (07)**
1. Explain the concept of redox potential and its importance in biological system.
 2. Explain the structure of ATP and write its significance.
- Q.2 (b) Attempt the following question (Any One)..... (04)**
1. Explain different high energy phosphate compound except ATP.
 2. Write about the significance of coupling reaction with suitable example.
- Q.2 (c) Attempt any three..... (03)**
1. Write first law of thermodynamics.
 2. What is system and surrounding?
 3. Write the application of free energy change in the prediction of biochemical reaction
 4. Define: Relative affinity of electron.
 5. Write the name of nucleotide which is also the currency of the cell.
- Q. 3 (a) Answer the following. (Any one)..... (07)**
1. Derive an equation to calculate the pH of a buffer solution.
 2. Explain phosphate buffer in detail.
- Q.3 (b) Attempt the following question (Any One)..... (04)**
1. Write a note on pH meter.
 2. Calculate the pH of 0.0001 N H₂SO₄ solutions.
- Q.3 (c) Attempt any three..... (03)**
1. What is Ka?
 2. Write the use of titration curve of acid/base.
 3. What will happen to the pH of distilled water if we increase the temperature?
(Increase/ Decrease/ Remains the same)
 4. What is the molarity of water?
 5. Define the term Kw.

- Q. 4 (a) Answer the following. (Any one)..... (07)**
1. Briefly discuss the importance and applications of viscosity.
 2. Define and write importance of diffusion in living systems.
- Q.4 (b) Attempt the following question (Any One)..... (04)**
1. Calculate the osmolarity of 0.2 M solutions of the following: Glucose, NaCl and CaCl_2 (M.Wt. 111)
 2. Briefly write about the applications of Osmosis and write difference between osmosis and diffusion.
- Q.4 (c) Attempt any three..... (03)**
1. How you can check the viscosity of solution?
 2. Why non polar molecule can easily cross the plasma membrane?
 3. Define the term: Absorption
 4. Which molecule will diffuse faster? N_2 , glucose and water?
 5. Write two factors which affect the viscosity of the solution.
- Q. 5 (a) Answer the following. (Any one)..... (07)**
1. If one person mixes 20 ml of 2% NaCl solution with 180 ml of 4% solution of KCl then find out the % of Na, K and Cl in the final solution.(Na- 23, Cl-35.5, K- 39)
 2. Prepare 200 ml of 10 mM working solution of fructose from 10.26 gm% (w/v) fructose stock solution.
- Q.5 (b) Attempt the following question (Any One)..... (04)**
1. What is the Molarity of 50 mg / 20 mL NaCl solution.
 2. Prepare 0.025 N, 100 mL solution of HCl from 1N stock solution.
- Q.5 (c) Attempt any three..... (03)**
1. What do you understand by 1:5 dilution?
 2. How one can prepare 2gm% NaCl solution?
 3. Define the term: Avogadro number
 4. What is equivalent weight?
 5. Define the term density.
