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

B.Sc. Semester - 1 (*CBCS*) Examination
Oct/Nov-2023 (Syllabus Year - 2016)
BIO-CHEMISTRY(CORE)

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

Instructions:

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

Que.1(A) Answer the following: (Any ONE out of two) (07)
1. Discuss Water as a biological solvent along with physical and chemical properties of water.
2. Write on Chemical bonds and their importance in structure of biomolecules.

Que.1(B) Attempt any ONE. (out of two) (04)
1. Write a note on weak chemical forces.
2. Discuss the structure of an atom.

Que.1(C) Attempt any THREE. (out of five) (03)
1. True or false: The bond in sodium chloride is an ionic bond.
2. What is a nucleophile?
3. True or false: A hydrogen bond is always a strong bond.
4. True or false: An atom has a characteristic van der waals radius.
5. True or false: An electrophile has electron deficient functional group.

Que.2(A) Answer the following: (Any ONE out of two) (07)
1. Discuss the concept of free energy.
2. Explain redox potential and its role in biological reactions.

Que.2(B) Attempt any ONE. (out of two) (04)
1. Write a note on high energy compounds.
2. Write on first and second law of thermodynamics.

Que.2(C) Attempt any THREE. (out of five) (03)
1. Name two thermodynamic quantities.
2. True or false: Hydrolysis of simple esters proceed with small standard free energy change.
3. True or false: Free energy change and standard free energy change are different quantities.
4. True or false: For a given reaction, standard free energy change is constant.
5. What is entropy?

Que.3(A) Answer the following: (Any ONE out of two) (07)
1. Write a note on physiological buffers and their importance.
2. Explain principle and working of a pH meter.

Que.3(B) Attempt any ONE. (out of two) (04)
1. Write a note on pH electrode.
2. Discuss titration curves of strong acids.

Que.3(C) Attempt any THREE. (out of five) (03)
1. Define pH.
2. What is pKa value?
3. Name factors affecting buffering capacity.
4. Write Henderson–Hasselbalch equation.
5. True or false: pH of distilled water is 7.0

Que.4(A) Answer the following: (Any ONE out of two) (07)
1. Discuss: Osmosis
2. Explain adsorption and its importance in life sciences.

Que.4(B) Attempt any ONE. (out of two) (04)
1. Write on viscosity.
2. Write on diffusion.

Que.4(C) Attempt any THREE. (out of five) (03)

1. True or false: viscosity changes with change in temperature.
2. What is hypertonic solution?
3. True or false: Flippase play important role in diffusion.
4. Adsorption does not require energy.
5. Define: Hypotonic.

Que.5(A) Answer the following: (Any ONE out of two) (07)

1. Write a note on concept of density.
2. Explain preparation of w/v, v/v and dilute solutions.

Que.5(B) Attempt any ONE. (out of two) (04)

1. Explain: Molar and molal solutions.
2. Write on specific gravity.

Que.5(C) Attempt any THREE. (out of five) (03)

1. True or false: Stock solutions can be useful in preparation of media.
2. How will you prepare 0.1M solution of NaCl?
3. Is it possible to prepare 25 ml 0.02% glucose solution from 25ml 0.2% glucose solution?
4. Which is more concentrated 5mM or 0.5M NaOH solution?
5. What do you mean by a 1N solution?

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