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

B.Sc. Semester - 1 (*CBCS*) Examination
Feb/Mar. -2021 (NEW COURSE)
BIO-CHEMISTRY (CORE)

Time: 1:30 Hours **Marks: 42**

Instructions:

1. Figures to the right indicate marks.
2. There are five questions in the question paper.
3. Answer any three of the following questions.

Q.1(A) **Answer <u>any one</u> of the following questions** (07)

1. Describe resonance bond giving three examples.
2. With well labelled diagram, explain the bonds involved in secondary interactions.

Q.1(B) **Answer <u>any one</u> of the following questions** (04)

1. Illustrate the type of bond in NaCl.
2. Give the importance of hydrophobic interaction.

Q.1(C) **Answer <u>any three</u> of the following questions** (03)

1. Give the composition of an atom.
2. What is polar bond?
3. Define: Electrophiles.
4. Name the most and least electronegative atom.
5. Why covalent bonds are irreversible?

Q.2(A) **Answer <u>any one</u> of the following questions** (07)

1. Why ATP has got high delta G?
2. a) Write the difference between electrochemical and electrolytic cell. (04)
   b) Show the method to calculate EMF of a cell. (03)

Q.2(B) **Answer <u>any one</u> of the following questions** (04)

1. Draw labelled structure of ATP.
2. Define and give importance of Biological Standard free energy change.

Q.2(C) **Answer <u>any three</u> of the following questions** (03)

1. What is oxidizing agent?
2. Calculate the total osmolarity of a solution that contains 1M sucrose, 1M Sodium chloride and 1 M Ferric chloride.
3. State First law of thermodynamics.
4. Giving example define Extensive properties.
5. Classify types of Phosphoryl compounds giving examples.

Q.3(A) **Answer <u>any one</u> of the following questions** (07)

1. Write a short note on physiological buffers.
2. Write the physical properties of acid and base and explain Bronsted acid base theory with any one example.

Q.3(B) **Answer <u>any one</u> of the following questions** (04)

1. Define pH and explain types of pH electrode.
2. Explain conjugated acid base pair with any one example.

Q.3(C) **Answer <u>any three</u> of the following questions** (03)

1. Which pH is most acidic pH 4 or pH 8?
2. Define buffer.
3. Define: respiratory acidosis
4. Define Arrhenius acid & base.
5. When base is added to dihydrogen phosphate / hydrogen phosphate buffer system, what will happen?

Q.4(A) **Answer <u>any one</u> of the following questions** (07)

1. Define Viscosity, give its unit and write applications of viscometry.
2. Write short note on importance of diffusion in living systems.

Q.4(B) **Answer <u>any one</u> of the following questions** (04)

1. How hypertonic solutions of salt or sugar can prevent microbial growth and hence are used for preservation of foods like pickles and jellies.
2. Explain: effect of temperature on viscosity.

Q.4(C) **Answer <u>any three</u> of the following questions** (03)

1. Give the examples of adsorbents.
2. Define: diffusion.
3. What is reverse osmosis?
4. What do you understand by fluidity?
5. Can glucose diffuse through the plasma membrane? Why?

Q.5(A) **Answer <u>any one</u> of the following questions** (07)

1. Prepare 500 ml of 10 mM solution of glucose from 5 gm% (w/v) glucose solution. Show all calculation steps.
2. Concentrated hydrochloric acid is usually available at a concentration of 37.7% by mass. What is its molar concentration? (The density of the solution is 1.19 g/mL.)

Q.5(B) **Answer <u>any one</u> of the following questions** (04)

1. Give characteristics of solution.
2. Calculate number of moles and number of atoms present in 60 g of NaOH. (Mol.wt – 40g)

Q.5(C) **Answer <u>any three</u> of the following questions** (03)

1. Define stock solution.
2. What is gram percentage solution?
3. What do you understand by Molarity?
4. Give a difference between molar and molal solution.
5. How can you convert saturated solution to unsaturated solution?

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