DCZ-003-2011022 Seat No. _____

B. Sc. (Sem. I) (CBCS) Examination

August - 2022

Biochemistry : Paper - 101

(Physical & Chemical Aspects of Biochemistry) (New Course)

Faculty Code : 003

Subject Code : 2011022

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

Instruction : Write any 5 out of 10 questions.

1 (a) Write the correct answers for the questions : **4**

(1) Define atomic number and atomic mass.

(2) What do you mean by nonpolar bond?

(3) Define : Electrophiles.

(4) Name the most and least electronegative atom.

(b) Comment : Nitrogen can form triple bonds. **2**

(c) Illustrate the type of bond in NaCl. **3**

(d) Describe Covent bond with any example. **5**

2 (a) Write the correct answers for the questions : **4**

(1) Define the term cation.

(2) What do you mean by dipole moment?

(3) Define : Ionic bond.

(4) Write any two examples of atom with its atomic mass.

(b) Write the difference between polar and non-polar compounds. **2**

(c) With well labelled diagram, explain the bonds involved in secondary interactions. **3**

(d) Give the importance of hydrophobic interaction. **5**

3 (a) Write the correct answers for the questions : 4

(1) Why ATP has got high delta G?

(2) Classify types of phosphoryl compounds giving examples.

(3) What do you mean by Enthalpy?

(4) What is oxidizing agent?

(b) Define exothermic reaction. 2

(c) State first law of thermodynamics. 3

(d) Giving examples define extensive properties. 5

4 (a) Write the correct answers for the questions : 4

(1) Draw labelled structure of ADP.

(2) Define third law of thermodynamics.

(3) Write the difference between first and second law of thermodynamics.

(4) What do you understand by thermodynamic system?

(b) Give relationship between equilibrium constant and ΔG. 2

(c) Define and give importance of biological standard free energy change. 3

(d) State second law of thermodynamics. 5

5 (a) Write the correct answers for the questions : 4

(1) Write the difference between pH and POH.

(2) Write the examples of biological buffer.

(3) Define : Respiratory alkalosis.

(4) Define Bromsted acid and Base.

(b) Calculate pH of 0.001 N HCl solutions? 2

(c) Define pH and explain types of pH electrode. 3

(d) Explain the titration curve of strong acid and weak base. 5

6 (a) Write the correct answers for the questions : 4

(1) Write the reaction between strong acid and weak base.

(2) Write the examples of biological buffer.

(3) Define : pKa value.

(4) Define Arrhenius acid and base.

(b) Explain strong acid and weak acid with any example. 2

(c) Explain conjugated acid base pair with any one example. 3

(d) Write the physical properties of acid and base and explain Lewis acid base theory with any one example. 5

7 (a) Write the correct answers for the questions : 4

(1) What do you mean by viscosity?

(2) Define : Diffusion.

(3) What do you mean by isotonic solution?

(4) What do you understand by fluidity?

(b) Write the difference between adsorption and desorption. 2

(c) How hypertonic solutions of salt or sugar can prevent microbial growth and hence are used for preservation of foods like pickles and jellies? 3

(d) Write applications of viscometry. 5

8 (a) Write the correct answers for the questions : 4

(1) Give the examples of adsorbents.

(2) Give the types of viscosity.

(3) What is reverse osmosis?

(4) Write the factors affecting the diffussion.

(b) Can glucose diffuse through the plasma membrane? Why? 2

(c) Explain : Effect of temperature on viscosity. 3

(d) Write short note on importance of diffusion in living systems. 5

9 (a) Write the correct answers for the questions : **4**

(1) Define normality.

(2) What is gram percentage solution?

(3) What do you understand by Molarity?

(4) How is solution formed by mixing solute and solvent?

(b) Calculate the molarity of NaOH in the solution prepared by dissolving its 4 g in enough water to form 250 mL of the solution. **2**

(c) Give characteristics of solution. **3**

(d) How will you prepare 0.2 M 450 mL NaOH solution? Give all the calculations. **5**

10 (a) Write the correct answers for the questions : **4**

(1) Define stock solution.

(2) What do you mean by dilution?

(3) Write the formula of molality.

(4) Give a difference between molar and molal solution.

(b) Define normality and equivalent weight, and give its calculation formula. **2**

(c) Discuss properties of water as solvent. **3**

(d) What is dilution? Explain by giving two-three examples. **5**
