



BBG-003-001114 Seat No. _____

B. Sc. (Sem. I) Examination

July – 2021

Biochemistry : Paper-101

(Physical and Chemical Aspects of Biochemistry)

Faculty Code : 003

Subject Code : 001114

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

1 Objective type questions : 20

- (1) What do you mean by the term 'molecule' ?
- (2) Define a Covalent Bond.
- (3) Which chemical bond is the strongest of all ?
- (4) What is Hydrogen Bonding ?
- (5) What is the angle between two bonds formed in water ?
- (6) What is neutralization reaction ?
- (7) What is the meaning of acid base titration ?
- (8) Define an oxidation reaction.
- (9) Write only the equation of pH.
- (10) Name any one blood buffer.
- (11) How can we find pOH from a pH of any substance ?
- (12) What is the name given to the negative electrode ?
- (13) Define Osmotic Pressure.
- (14) Write a difference between a semipermeable and selectively permeable membrane.
- (15) How Adsorption differs from Absorption ?
- (16) What is the meaning of Viscosity ?
- (17) Define 1 mole of a substance.

- (18) What is stock solution ?
- (19) Write the formula to find out density of any substance.
- (20) What is the specific gravity of water ?

2 (a) Answer in brief : (any 3 out of 6) 6

- (1) Write any two differences between a polar covalent bond and a non polar covalent bond.
- (2) Write examples of inter molecular H bonds.
- (3) Write differences between an acid and a base with examples.
- (4) Write two examples of strong acids and weak bases.
- (5) Calculate the pO Hof0.1 N NaOH.
- (6) What is the meaning of dilute and concentrated solution ?

(b) Answer in detail : (any 3 out of 6) 9

- (1) What is an atom ? Give examples of Diatomic molecules.
- (2) Write three differences between electrophiles and nucleophiles.
- (3) Describe importance of weak interactions in a living system.
- (4) Write in brief about :
 - (i) Dipole moment
 - (ii) Effects of H Bonds
- (5) Describe Redox reactions with the help of chemical equations.
- (6) Write three differences between oxidation reactions and reduction reactions.

(c) Answer any two out of five : 10

- (1) Write importance of water in a biological system.
- (2) Describe physical and chemical properties of water.
- (3) Explain factors affecting buffering capacity.
- (4) Write a short note on different types of Chemical Bonds.
- (5) Write a short note on pH metre.

3 (a) Answer any three out of the following questions : 6

- (1) What is the conjugate acid of ammonia and water ?
- (2) Describe Osmosis.
- (3) What is the meaning of ppm and ppb
- (4) How equivalent weight of a substance is different from its molecular weight ?
- (5) What is the meaning of permeability ?
- (6) 'Osmosis is a type of diffusion'. Justify.

(b) Answer any three out of six questions : 9

- (1) Define solute, solvent and solution.
- (2) Which factors affect Adsorption ?
- (3) (i) Find out the %v/v of 20 ml of a cough syrup dissolved in 80 ml of water using the proper equation.
(ii) Find out the %w/v of 10 g of a sugar dissolved in 200 ml of water.
- (4) Find the Normality of 98g of sulphuric acid dissolved in 1L water.
- (5) Calculate the molarity of a 10g NaCl dissolved in 100 ml of solution.
- (6) Calculate the molarity of 20 g NaOH dissolved in 100 g of solvent.

(c) Answer any two out of five : 10

- (1) Describe the types and importance of physiological buffers.
- (2) Write a short note on importance and applications of Osmosis and Diffusion.
- (3) Describe in detail the role of Viscosity and Adsorption in a living system.
- (4) Define :
 - (a) Normality
 - (b) Molarity
 - (c) Molality
 - (d) Density
 - (e) Mole number
- (5)
 - (a) Calculate the molarity of a solution containing 8 g NaOH dissolved in 50 g of solution.
 - (b) Find the Molality when 73 g of HCl is dissolved in 500 ml of water.

[Atomic masses of H = 1g, Cl = 35.5 g, Na = 23g, O = 16g, S = 32g]
