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PBP-003-001114 Seat No. _____

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

November / December - 2018

Biochemistry

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

Faculty Code : 003

Subject Code : 001114

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

Instructions :

(1) All objective type questions are compulsory.

(2) Figures on the right indicate marks of individual questions.

1 Objective type questions. **1×2=20**

(1) Atomic weight is sum of the mass of _____ and ____ of an atom.

(2) Atoms having same atomic number but have different atomic mass are called _____.

(3) The region around the nucleus of an atom in which there is high probability of finding electrons is known as _____.

(4) Primary structure of any biomolecule is determined by _____ bond whether small or large molecule.

(5) Enlist physical property of water.

(6) Compound having a tendency to mix with, dissolve in, or be wetted by water is known as _____.

(7) One compound can release/donate H^+ to other compound in reaction, so this type of reaction is called as _____ process.

(8) _____ acid is found in gastric juice of stomach.

(9) Give the example of extracellular fluid buffer.

(10) A buffer solution is one which resist change in _____ even upon addition of small amount of acid or base.

(11) State the limit of pH scale.

(12) Which solution is filled in glass electrode ?

(13) Water molecules (solvent) transport across semi-permeable membrane, this phenomenon is known as _____.

(14) Unit of Viscosity is _____.

(15) If Red Blood cells are suspended in hypertonic solution of NaCl, water flows out of RBC and the cytoplasm shrinks, this phenomenon is referred to as _____.

(16) Cigarette smoke is spreading throughout the room, this is example of simple diffusion. True/False ?

(17) Which component constitutes solution ?

(18) 1 mole can be defined as the molecular weight of a substance in milligrams. Is it true/false ?

(19) An object's mass per unit volume is called as _____.

(20) What is Molarity ?

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

(1) The covalent bonds are irreversible. Why ?

(2) Explain oxidation and reduction reaction with example.

(3) Explain Glass electrode.

(4) Write the application of viscosity.

(5) How do you prepare 10% w/v NaOH solution ? (m.w. 40)

(6) According to Bronstead Lowry theory, what is Acid and Base ? Give example.

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

(1) Illustrate the type of bond in H_2O molecule.

(2) Explain : physical property of water.

(3) What is Buffer capacity ? Explain factors that affect buffering capacity.

(4) Write a note on Haemoglobin buffer system.

(5) How do you prepare 200 ml of 10 M working solution from 36 Molar stock solution of H_2SO_4 ?

(6) What is concept of pH and pOH ? Write the methods which determine pH of the solution.

(c) Write a note on : (any 2 out of 5) **2×5=10**

(1) Write molecular formula of water. Write its molecular weight. Describe chemical property of water.

(2) Explain titration curve of acid and base.

(3) Explain S.H.E. (electrode) with its limitation.

(4) Explain Osmosis and its importance to human life.

(5) Define percent solution. Explain all types with examples. Differentiate between stock solution and working solution.

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

(1) Justify : Water act as a biological solvent.

(2) Write effect of hydrogen bonding.

(3) Write meaning of Ka and pKa values.

(4) Explain principle of pH meter.

(5) If the density of iron is 5670 kg/m^3, the specific gravity of iron is ?

(6) Differentiate Osmosis and Diffusion.

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

(1) Explain Van der Waals forces giving two examples.

(2) Explain the role of redox potential in biological reaction.

(3) Explain working of pH meter and write the type of electrodes.

(4) Explain Adsorption and Absorption and write its characteristics.

(5) Define Normality, Molarity and Molality.

(6) Draw the labelled diagram/figure of electrodes of pH meter.

(c) Write a note on : (any 2 out of 5) **2×5=10**

(1) Explain covalent bond in detail.

(2) Derive Henderson-Hasselbatch equation.

(3) Which elements constitute water molecule ? By which bond these elements are connected ? Explain it. Write importance of water for living organisms.

(4) Describe in detail : Diffusion.

(5) Define pH and write its equation and explain the factors that affect the pH and calculate the numerical problem given below :
What is the pH of 0.01 N HCl solution ?
