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MBH-003-1011022 Seat No. _____

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

November / December – 2016

Biochemistry - 101

(Physical & Chemical Aspects of Biochemistry)

Faculty Code : 003
Subject Code : 1011022

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

Q1 (a) Objective Type Questions : 4 Marks

1. Define an atom.
2. What is a co-valent bond?
3. Name any two weak chemical interactions/forces.
4. How atomic number is different from atomic mass of an element ?

Q1 (b) Answer in brief (Any 1 out of 2) 2 Marks

1. Write any two difference between atomic number and atomic mass?
2. How metallic bonds are different from ionic bonds?

Q1(c) Answer in detail (Any 1 out of 2) 3 Marks

1. Explain dipole moment concept.
2. What are electrophiles and nucleophiles. Give two examples of each.

Q1. (d) Write short notes on (Any 1out of 2) 5 Marks

1. H-Bonds : Definition, their types and their effects / importance.
2. Water : Its different properties and importance to life.

Q2 (a) Objective Type Questions : 4 Marks

1. What do you mean by the term " thermodynamics".?
2. Define first law of thermodynamics.
3. What is "Free Energy"?
4. Which type of reactions are said to be Redox Reactions?

Q2 (b) Answer in brief: (Any 1 out of 2) 2 marks

1. Explain second law of thermodynamics.
2. What is Entropy ? How it differs from Enthalpy?

Q2 (c) Answer in detail (Any 1 out 2) 3 marks

1. Write differences between oxidation and reduction processes with examples.
2. How free energy is related to spontaneity of any biochemical reaction. Explain

Q2 (d) Write short notes on: (Any 1 out of 2) 5 marks

1. Explain the role of Redox reactions / Redox potential in biochemical reactions.
2. High energy compounds and their applications in biochemistry.

Q3 (a) Objective type questions 4 marks

1. Define pH.
2. What is a buffer?
3. Give an example of a strong acid and weak acid ?
4. What is the name given to negative electrode and that to positive electrode?

Q3 (b) Answer in brief (any 1 out of 2) 2 marks

1. Differentiate between an acid and a base.
2. Write any two factors affecting buffering capacity.

Q3 (c) answer in detail (any 1 out 2) 3 marks

1. Calculate the pOH &pH of 0.1 N HNO_3.
2. Calculate the H+ concentration for the pH of blood. (consider pH of blood as 7.4)

Q3 (d) write short note on (any 1 out of 2) 5 marks

1. Physiological buffers
2. pH meter : types of electrode , Principle and working

Q 4 (a) Objective type questions 4 marks

1. Define osmosis.
2. What is viscosity ?
3. What is the direction of movement of solute during diffusion?
4. Give example of an absorbent.

Q 4 (b) Answer in brief (any 1 out of 2) 2 marks

1. Mention the factors affecting the process of adsorption?
2. What is reverse osmosis ? State its principle.

Q 4 (c) Answer in detail (any 1 out 2) 3 marks

1. Can RBC count effects the viscosity of the blood ? Justify.
2. Write the significance of adsorption in chromatography

Q 4 (d) Write a note on (any 1 out 2) 5 marks

1. Biological importance of Osmosis , Viscosity and Diffusison .
2. Adsorption : Definition, Types, Three examples of Adsorbents and Biological Importance.

Q 5 (a) Objective type questions 4 marks

1. What is 1 Molar solution?
2. How many moles of glucose are present in its 3600 gm .
3. What is ppm ?
4. What is specific gravity?

Q 5 (b) Answer in brief (Any 1 out of 2) 2 marks

1. What is the formula to find molality and normality?
2. What is 1 mole ?

Q 5 (c) Answer in detail (Any 1 out of 2) 3 marks

1. What is w/w ,w/v and v/v ? Write their formule.
2. What is the molarity and normality of HCl and H_2SO_4 ?

Q 5 (d) Write a note on (Any 1 out of 2) 5 marks

1. Find the number of moles in :
   a) 40 gram of Calcium (Z = 40 u)
   b) 12.044×10^{23} atoms of Mg.
   c) 36 gram of Carbon (Z= 12 u)
   d) 72 gram of Water (Atomic no. of H =1 u and that of O =16u)
   e) 900 gram of $C_6H_{12}O_6$
2. What is the specific gravity of alcohol having a density of 0.79g/ml? Write the formula and units of density and specific gravity.