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JAU-003-0011014   Seat No. _____

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

December - 2019

Biochemistry : Paper - 101

(Physical and chemical aspects of Biochemistry)

Faculty Code : 003

Subject Code : 0011014

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

1   (A)   Write the correct answer for the questions :   **4**

    (1)   Define the term molecule. Give example.

    (2)   Give the definition of Electrophile.

    (3)   Write an example of strong and weak bond.

    (4)   What is bond energy?

  (B)   Write the answer in brief : (Any **One** out of Two)   **2**

    (1)   Write the difference between polar and Non-polar bond.

    (2)   Write the significance of Vanderwaal's bond.

  (C)   Write the answer in detail : (Any **One** out of Two)   **3**

    (1)   Write a detailed note on ionic bond.

    (2)   Discuss very briefly: water is a universal solvent.

  (D)   Write a Short note in detail : (Any **One** out of Two)   **5**

    (1)   Write the difference between primary and - secondary bond. Write. the significance of secondary bonds.

    (2)   Explain Resonance bond with its structure.

JAU-003-0011014]   1   [Contd....

2   (A)   Write the correct answer for the questions :   **4**

     (1)   Define first law of thermodynamics.

     (2)   What do you mean by Redox reaction?

     (3)   What is isothermal process? Give example.

     (4)   Define: Gibbs free energy $\left(\Delta G \right)$.

    (B)   Write the answer in brief : (Any **One** out of Two).   **2**

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

     (2)   Explain ΔG° with its sign and value for system.

    (C)   Write the answer in detail : (Any **One** out of Two)   **3**

     (1)   Write a note on free energy changes for ATP hydrolysis.

     (2)   How standard reduction potential can be used to calculate free energy change?

    (D)   Write a Short note : (Any **One** out of Two)   **5**

     (1)   Define the term entropy and enthalpy. Give its function in biological system.

     (2)   Write a detailed note on biological oxidation Process.

3   (A)   Write the correct answer for the questions :   **4**

     (1)   What is buffer? Give two examples.

     (2)   Define the term pH and pOH.

     (3)   Define Arrhenius acid and base.

     (4)   What do you mean by pKa value?

    (B)   Write the answer in brief : (Any **One** out of Two)   **2**

     (1)   If the H+ ion concentration is 0.0001 M, what will be the pOH and pH of solution?

     (2)   Write the properties of acid and base.

(C) Write the answer in detail : (Any **One** out of Two)   **3**

    (1) Write about dissociation constant of acid and base.

    (2) Write a brief note on Hesselbalch equation

(D) Write a Short note : (Any **One** out of Two)   **5**

    (1) Explain shape of titration curve of strong acid and strong base.

    (2) Write a detailed note note on pH meter. Write the role of bicarbonate, as physiological buffer.

4 (A) Write the correct answer for the questions :   **4**

    (1) What do you mean by diffusion?

    (2) Define : adsorption.

    (3) At what temperature rate of simple diffusion becomes zero?

    (4) What is viscometry?

(B) Write the answer in brief : (Any **One** out of Two)   **2**

    (1) What do you understand by osmotic pressure?

    (2) Write the significance of viscosity in biological systems.

(C) Write the answer in detail : (Any **One** out of Two)   **3**

    (1) What is reverse osmosis? Write the application of reverse osmosis.

    (2) Write the different applications of charcoal.

(D) Write a Short note : (Any **One** out of Two)   **5**

    (1) Give idea about diffusion. Write importance of diffusion in living systems.

    (2) Define the term viscosity. Give the factors affecting on viscosity.

5 (A) Write the correct answer for the questions : **4**

   (1) How will you convert saturated solution to unsaturated solution?

   (2) Define: Solubility.

   (3) How will you prepare 10% v/v ethanol solution?

   (4) Define the term Mole.

(B) Write the answer in brief : (Any **One** out of Two) **2**

   (1) Write the difference between Normality and Molarity

   (2) What do you mean by w/v and v/v ?

(C) Write the answer in detail : (Any **One** out of Two) **3**

   (1) Claculate Molarity of 2.8 m NaOH solution having density of 2.16 g/mL.

   (2) Define Solution and state factors affecting solution formation.

(D) Write a Short note : (Any **One** out of Two) **5**

   (1) Calculate molality, mole, and number of atoms of 10 % m/m $CaCl_2$ Solution. (Mol wt: 111 g)

   (2) You have a solution that is 10.6%, $NaOH$, by mass.

      (a) What mass of sodium hydroxide is there in 80.0 g. of solution?

      (b) How many moles of sodium hydroxide are in 80.0 g of solution?