



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.

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- 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 (ΔG).

- (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 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) Calculate 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?