

Roll No:

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M.Sc. Biochemistry, Semester-I Examination-2023
Paper Title: Fundamentals of Biochemistry and Biophysics
Paper Code: MBC 107

Time: 1.5hour

Max Marks: 30

Note: This paper has 3 sections A, B, and C, Attempt all the three sections

Section A: Answer all the questions; Section B: Answer any 1 out of 2; Section C: Answer all the questions, each question has an internal choice

Abbreviations Used

CLO- Course Learning Outcome, PLO- Program Learning Outcome, BTL- Bloom Taxonomy Level: BT level 1-Remember; BT level 2-Understand; BT level 3-Apply; BT level 4-Analyse; BT level 5-Evaluate, BT level 6-Create

Section A (Attempt all questions)

(1X6= 6 Marks)

Q. No	Questions	BTL	CLO	PLO
A	 grams of HCl will be present in 250ml of its 0.42M solution	1	5	3
B	For a reaction $A+B \rightarrow C$, the experimental rate law is found to be $r = K[A]^1[B]^{1/2}$. The rate of the reaction when $[A]=0.5$ M, $[B]=0.2$ M and $K=0.03$ will be.....	3	1	3
C	Energy rich bond in Acetyl CoA is.....	5	3	2
D	Molarity of solution prepared by mixing 2.5gm of NaCl in 500ml water is.....	4	5	3
E	Buffers are formed by combination of.....and.....	3	1	2
F	If $Q_c > K_c$ then the reaction will proceed in.....direction	1	3	2

SECTION B: Long type Questions (Attempt any one out of two)

(1X12=12 Marks)

Q. No	Questions	BTL	CLO	PLO
1	What are High Energy Compounds and give reasons why ADP is more stable than ATP and the factors that favours hydrolysis of PEP to Pyruvate	1	3	2
2	Discuss briefly Chemical Equilibrium, Equilibrium Constant, Reaction Quotient and how the direction of reaction can be predicted from Q_c and K_c value	5	1	2

SECTION C: Short-type Questions. (Attempt all questions, each question has an internal choice) (3X4=12 Marks)

Q. No	Questions	BTL	CLO	PLO
1	Define Polymerisation, Degree of polymerisation and discuss in detail chain growth and step growth mechanism of polymerisation OR Explain important Biological Small and Macromolecules along with their structure and functions	4	4	3
2	Discuss in detail the order and molecularity of the reaction with suitable examples. Also, outline the differences between them OR Describe the different ways to express the Concentration of Solution and determine how would you prepare 1000ml of 2M solution of Tris Buffer from a 4M stock of Tris Buffer	3	5	3
3	If the K_{eq} , for the reaction is $3.22 \times 10^5 M$, Calculate free energy change (ΔG°), for the synthesis of ATP from ADP and P_i at $25^\circ C$. ATP-----ADP + P_i OR Derive the Equation that Relates pH, pKa, Buffer Concentration and determine the pH of the mixture of 0.042M NaH_2PO_4 and 0.058M Na_2HPO_4	5	2	1
