UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2023

Course: Biochemistry   Semester : I
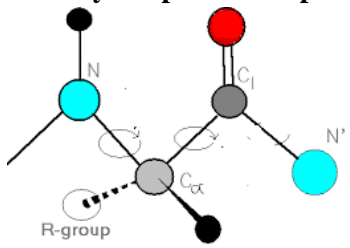Program: MSc Microbiology   Duration : 3 Hours
Course Code: HSMB7008   Max. Marks: 100

Instructions:

S. No.	Section A Short answer questions/ MCQ/T&F (20Qx1.5M= 30 Marks)	Marks	COs
Q 1	Define chiral carbon.	1.5	CO1
Q 2	Identify the position of psi and phi bond in the given structure 	1.5	CO1
Q 3	Define anomeric carbon.	1.5	CO1
Q 4	Define energy rich compound with an example.	1.5	CO1
Q 5	Draw the structure of any acidic amino acid.	1.5	CO1
Q 6	State the name of amino acids having guanidinium group.	1.5	CO1
Q 7	If a cofactor binds covalently, called it as…….	1.5	CO1
Q 8	For a spontaneous reaction to occur, $\Delta G>0$ (True/False) Explain.	1.5	CO1
Q 9	Define zwitter ions.	1.5	CO1
Q 10	Recall net ATP produced per glucose molecule in TCA cycle.	1.5	CO1
Q 11	Draw the structure of maltose.	1.5	CO2
Q 12	Discuss iodine number.	1.5	CO2
Q 13	Live cells resemble a closed system. True/False	1.5	CO2
Q 14	Recall the structure of lauric acid (12:0).	1.5	CO2
Q 15	Describe why aquatic animals have more unsaturated fatty acid?	1.5	CO2
Q 16	Ramachandran plot is used to describe tertiary structure of proteins. True/False	1.5	CO2
Q 17	Explain why unsaturated fatty acids liquid and saturated fatty acids are waxy in nature at room temperature	1.5	CO2
Q 18	Describe Michaelis-Menten constant.	1.5	CO2
Q 19	Identify the order of reaction and label A, B and C	1.5	CO2

Q 20	**Discuss the relationship between chain length of fatty acid and melting point.**	**1.5**	**CO2**

Section B
(4Qx5M=20 Marks)

Q 1	**Recall α- helix structure of proteins.**	**5**	**CO1**
Q 2	**Describe the steps of alcoholic fermentation of pyruvate.**	**5**	**CO2**
Q 3	**Explain the different kind of weak and strong interactions involve in stabilizing tertiary structures of proteins.**	**5**	**CO3**
Q 4	**Derive the Lineweaver-Burk plot equation and explain the significance of Km and Vmax.**	**5**	**CO5**

Section C
(2Qx15M=30 Marks)

Q 1	**Discuss what enzyme does in a reaction and how enzymes operate. The below given diagram represents comparison of uncatalyzed with enzyme catalyzed reaction. Label A, B, C, D, E, F, G and H.**	**4+3+8**	**CO3**
Q 2	**Defend the given below statement:** **One Glucose molecule converted in two molecules of pyruvate through multistep process and net yield is two ATP per glucose.**	**15**	**CO5**

Section D
(2Qx10M=20 Marks)

Q 1	Schematically demonstrate how TCA cycle is linked with Electron Transport Chain (ETC).	10	CO4
Q 2	Compare and contrast different kinds of enzyme inhibitions with suitable examples.	10	CO4