Name: Enrolment No:	

UPES

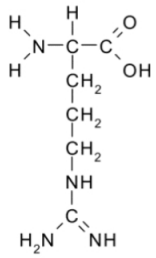
End Sem Examination, December 2024

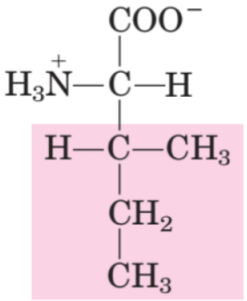
Course: Biochemistry **Semester : I**

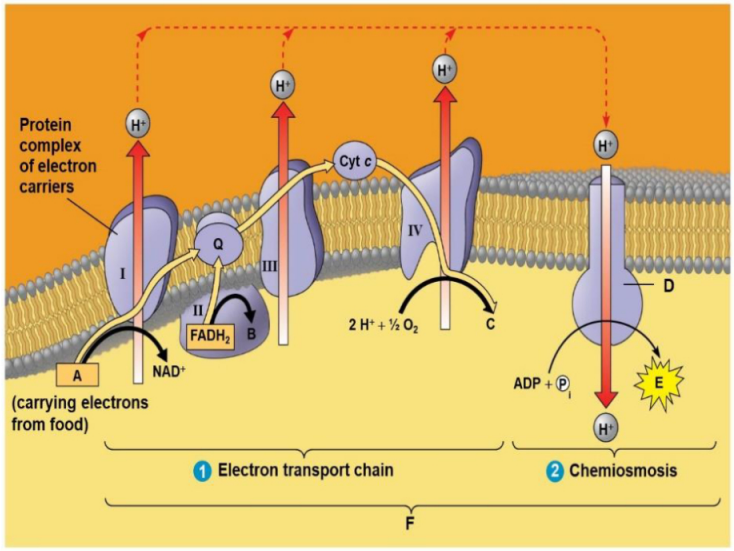
Program: MSc Microbiology and N&D **Duration : 3 Hours**

Course Code: HSMB7036 **Max. Marks: 100**

Instructions: Please read questions carefully and follow the instructions.

S. No.	Section A Short answer questions/ MCQ/T&F (20Qx1.5M= 30 Marks)	Marks	COs
Q 1	Define pH.	1.5	CO1
Q 2	Draw the structure amino acid that makes disulfide bond.	1.5	CO1
Q 3	Define Chargaff's rule.	1.5	CO1
Q 4	Identify the below given structure: 	1.5	CO1
Q 5	Define lipids and write any one function.	1.5	CO1
Q 6	State the name of amino acids that destabilize α-helix.	1.5	CO1
Q 7	If a cofactor binds covalently, called it as…….	1.5	CO1
Q 8	Consider the following statements and identify which is INCORRECT a. Fibrous proteins are insoluble in water b. Globular proteins are compact and spherical c. Globular proteins are insoluble in water d. Fibrous protein example is keratin	1.5	CO1
Q 9	Define isoelectric point (pI).	1.5	CO1
Q 10	An organic substance bound to an enzyme and essential for the activity of enzyme is called: a. Holoenzyme b. Apoenzyme c. Coenzyme d. Isoenzyme	1.5	CO1
Q 11	Two successive nucleoside residues link together by……	1.5	CO2
Q 12	Enzymes increase the rates of reactions by: a. Increasing the free energy of activation b. Decreasing the energy of activation c. Changing the equilibrium constant of the reaction d. Increasing the free energy change of the reaction	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	**Which of the following is FALSE about lipids** **a. They are either strongly hydrophobic or hydrophilic** **b. They are more soluble in water** **c. They are more insoluble in water** **d. Extraction of lipid from tissue required organic solvent**	**1.5**	**CO2**
Q 19	**The first substance produced in the citric acid cycle:** **a. Citric acid b. Fructose c. Acetyl CoA d. Oxaloacetate**	**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	 **Above is the structure of isoleucine amino acid. Solve the following question based on the above structure.** **(i) How many chiral centers does it have?** **(ii) How many optical isomers are possible for the given structure?**	**5**	**CO1**
Q 2	**Explain the biochemical mechanism transformation of curly to straight hair.** **Or** **Estimate the distance covered by 150 amino acids long α-helix.**	**5**	**CO2**
Q 3	**Explain the reason for the absence of proline and glycine in the alpha helical structure of protein.**	**5**	**CO3**
Q 4	**Discuss role of various kinds of weak interactions in stabilizing structures of proteins.** **Or** **Differentiate between saturated and unsaturated fatty acids with examples.**	**5**	**CO4**
	Section C **(2Qx15M=30 Marks)**		
Q 1	**Discuss the various historical methods used for naming enzymes and discuss why a standardized IUBMB classification system became**	**5+10**	**CO3**

	necessary. Additionally, describe the IUBMB enzyme classification system in detail with suitable examples for each category. **or** **Discuss protein deficiency and overconsumption. Examine the excretion pathway of excess nitrogen resulting from the breakdown of amino acid in the form of urea molecule inside the cell.**		
Q 2	**a. Differentiate between globular and fibrous protein.** **b. Differentiate between α-helix and β-sheet.** **c. Differentiate between primary and secondary structures.**	**15**	**CO4**
	Section D **(2Qx10M=20 Marks)**		
Q 1	 **Label A, B, C, D, E and F in the given diagram**	**10**	**CO3**
Q 2	**Describe the chemical reactions of TCA cycle where NADH is produced.**	**10**	**CO4**