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Course Name: BSc Toxicology, Semester-I End Semester Examination (2023-2024)

Paper Name- Chemistry of Life

Paper Code BTX DSC-101

Time: 2.5 h

Maximum Marks: 60

Note: This Paper has three sections; A, B and C. Attempt all the three sections

Section A: Answer all the questions; SECTION B: Answer any two of four; Section C: Answer any four of five.

SECTION A

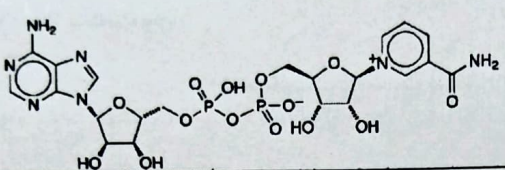
Very short type question (One word to one sentence). (Marks 20 x 1)

Q.no.	Question	Marks	BTL
1.	Glucose is stored in the body after being converted to.....	1	2
2.	Catalysts enhance reaction rates by increasing the activation energy. Is this statement true or false (T/F)?	1	4
3.	What is the basis of classifying HCl as a strong acid and Acetic acid as a weak acid?	1	4
4.	Name the key fatty acid present in the olive oil.	1	2
5.	How is substrate concentration (K_m) related to maximum velocity (V_{max}) of an enzyme?	1	4
6.	Peptide bond is a "partial double bond". Is this statement true or false (T/F)?	1	2
7.	Name a disease which is caused by the deficiency of Dopamine.	1	3
8.	Name the two pyrimidine bases in RNA.	1	1
9.	Which of the two has protective action, HDL or LDL, and why?	1	2
10.	How do you calculate pH of a solution?	1	2
11.	Who proposed the cell theory?	1	5
12.	What is the basis of classifying amino acids into essential and non-essential AA?	1	2
13.	A substrate of a particular enzyme usually binds to its allosteric site. Is this statement true or false (T/F)?	1	3
14.	What is the role of mRNA in protein synthesis? Name the scientists who received Nobel prize in medicine for breakthrough in mRNA vaccines in 2023.	1	4
15.	Name the enzyme kinetics plot that plots between $1/V$ and $1/S$?	1	3
16.	What is the importance of "glycated hemoglobin"?	1	4
17.	What are isoenzymes?	1	2
18.	What is a prosthetic group and a holoenzyme called in an enzyme structure?	1	2
19.	What is a "secondary metabolite"? Explain with an example.	1	3
20.	Name the cell organelles that have double-membrane structure.	1	2

SECTION B

Short type question (Attempt any four out of the six). (Marks 4 x 5)

Q.no.	Question	Marks	BTL
1.	Write a short note on γ -amino butyric acid (GABA).	4	5
2.	Explain classification and functions of Lipids.	4	5

3.	Mention all functional groups, linkages, and type of rings present in the compound below:	4	3
			
4.	What do you understand by active site of an enzyme? What is "competitive enzyme inhibition"? Explain with an example.	4	3
5.	Explain the bicarbonate and protein buffer system in our body.	4	2
6.	Explain the structure and function of Mitochondria.	4	4

SECTION C

Long type question (Attempt any two out of four). (Marks 2 x 10)

Q.no.	Question	Marks	BTL
1.	(a) Derive Handerson-Hasselbach equation. (b) A buffer solution contains 0.36 M of sodium acetate and 0.45 M of acetic acid, pKa is given 4.8. What is the pH of the buffer solution? (Log 2 = 0.301, Log 5 = 0.69)	10	4
2.	What are Nucleic acids? Explain all the components of nucleic acids with proper structures.	10	3
3.	Differentiate between primary, secondary, tertiary, and quaternary structure of proteins. Briefly explain the concept of denaturation of proteins.	10	3
4.	(a)What are Enzymes? (b)Explain the Michaelis-Menten model for enzyme-catalyzed reaction (c)What causes the dramatic lowering of the activation energy when enzyme is used a catalyst?	10	3