Roll No: _____

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BSc (FYUP) Biochemistry, Semester 01 Examination, 2024

Paper Title: Biomolecule (Theory)
Paper Code: BBC DSC-101

Time: **2½ h** Max Marks: **60**

Note: *This paper has 3 Sections, A, B, and C. Attempt all three sections. Section A: Answer all the questions; Section B: Answer any two; Section C: Answer all the questions, each question in this section has an internal choice.*

Course Learning Outcomes:
CLO-1: Acquainted with chemical and molecular foundations of life and appreciate the role of water in biological systems.
CLO-2: Able to comprehend the structure, function and acid base properties of amino acids.
CLO-3: Evaluate the structure, properties and roles of carbohydrates, lipids and nucleic acids.
CLO-4: Aware of the importance of vitamins in biological systems.
CLO-5: Able to independently identify, quantify and analyse various biomolecules in the laboratory

Section A: OBJECTIVE TYPE QUESTION
Attempt ALL questions (1x12=12 Marks)

Q. No. 1	Questions	BTL	CLO	PLO
i.	Nature of glycosidic linkage in Glycogen……..	1	1	3
ii.	Glucose and Mannose are……epimers	2	1	2
iii.	Aldaric acids are formed by the oxidation of ……. ..	4	1	3
iv.	The covalent backbone of nucleic acid consists of……..	3	3	3
v.	In one strand of DNA, the ratio of A+G/C+T=0.8. What will be the ratio of complementary strand……	5	3	3
vi.	…… and …… nucleotides can act as second messengers	1	3	2
vii.	Coenzyme that acts as transient carrier of CO_2……	2	4	3
viii.	Example of hormone that exerts much of its effects through intracellular receptors that in complex form binds to DNA response elements……	5	4	1
ix.	…… vitamin is only found in foods of animal origin.	3	4	2
x.	The degree of unsaturation of lipids can be measured as ……	2	3	3
xi.	Cardiolipin is a type of …… lipid	1	3	3
xii.	In proteins, multiple amino acids are linked together by ……	4	2	3

Section B: LONG ANSWER QUESTIONS
Attempt any TWO out of four questions (12x2=24 Marks)

Q. No. 2	Questions	BTL	CLO	PLO
a)	Draw structure of D-Glucose by Fischer's and Haworth's projection formula	1	1	2
b)	Define storage and structural lipids. Explain 2 examples of each type with structure, composition and their roles for each example.	4	3	2
c)	Explain the Watson and crick model of DNA. Compare it with A and Z forms of DNA	4	3	3
d)	What is the primary role of hormones in animals and highlight major endocrine hormones and their target tissues.	2	4	3

Section C: SHORT ANSWER QUESTIONS
Attempt ALL questions, each question has an internal choice (4x6=24 Marks)

Q. No. 3	Questions	BTL	CLO	PLO
a)	Give a comparative account of Glycosaminoglycan, Proteoglycan and Glycoprotein with the help of suitable example **OR** Draw the structure of an Aldose and a Ketose sugar and highlight which has more chiral centers and total number of possible isomers	3	1	2
b)	Write differences between: Homo & Heteropolysaccharides with suitable example and structure **OR** Differentiate the structural and functional differences between the 3 major forms of RNA (mRNA/tRNA/rRNA)	2	3	3
c)	Justify the statement "Adenine nucleotides are components of many enzyme cofactors" **OR** Highlight general cloverleaf secondary structure of tRNAs and describe denaturation of double stranded nucleic acid	1	3	2
d)	Outline the classification and nomenclature of enzyme with reference to Hexokinase enzyme **OR** Highlight the differences between Coenzymes & Co-factors and list important example of it.	4	5	3
e)	Explain the regulation and secretion of hormone which have nuclear receptor **OR** Differentiate structurally between Micelle, Bilayer, and liposomes. What is the role of each.	2	3	2

f)	What do you understand by membrane fluidity and its regulation. **OR** Draw the different ionization states of glutamate on moving from pH = 1 to pH = 11, where its pk1 = 2.19, pK2 = 9.67, and pKr = 4.25. Also calculate its pI.	**3**	**2**	**3**

END OF THE QUESTION PAPER