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Avinashilingam Institute for Home Science and Higher Education for Women
Deemed to be University Estd. u/s 3 of UGC Act 1956; Category A by MHRD (now MoE)
Re-accredited with A++ Grade by NAAC. CGPA 3.65/4, Category I by UGC
Coimbatore - 641043, Tamil Nadu, India

Bachelor's Degree Examination - November 2025
I Semester

Class : I UG / 2024 Batch **Time : 3 Hours**
Major : Biochemistry and Biotechnology **Max. Marks : 100**

23BBCC01 Introduction to Biochemistry and Biomolecules

Course Outcomes:
CO1: Understand the fundamental knowledge and basic concepts and principles of biochemistry.
CO2: Assess about the structure and functions of biomolecules in living system
CO3: Understand the physical and chemical properties of biomolecules.
CO4:To impart knowledge on the structure and biologically important complex biomolecules.
CO5: To study the nature, physical and electrochemical properties of amino acids in proteins.

Part A **10 x 1 = 10**

Choose the Correct Answer

1. Identify the buffer system which is the primary regulator of blood pH?
   a. Phosphate buffer b. Protein buffer
   c. Bicarbonate buffer d. Ammonia buffer CO1 K1

2. Show the property that makes water an excellent solvent for ionic and polar compounds.
   a. Dipole nature and hydrogen bonding b. Low heat of vaporization
   c. High compressibility d. Low dielectric constant CO1 K2

3. Give the main biological function of hyaluronic acid from the following.
   a. Blood clotting
   b. Storage of glucose
   c. Formation of DNA
   d. Lubrication and shock absorption in joints CO2 K1

4. Mention the amino acid that is commonly unique to bacterial peptidoglycan.
   a. L-glutamate b. D-alanine c. Glycine d. L-lysine CO2 K2

5. Provide the condition would show elevated thromboxane activity.
   a. Uncontrolled bleeding disorder b. Vasodilation during exercise
   c. Acute myocardial infarction d. Hypotension CO3 K1

6. Find from the following that involved in the functional property of lipids as membrane components.
   a. Cholesterol only b. Amphipathic nature
   c. Glycerol backbone d. Sulphur bonds CO3 K2

7. Identify the sulfur-containing amino acids that important for protein folding.
   a. Methionine and Cysteine b. Glycine and Alanine
   c. Lysine and Arginine d. Proline and Hydroxyproline CO4 K1

8. Which amino acid reaction is essential in forming disulfide bridges in proteins?
   a. Decarboxylation of glutamate b. Hydroxylation of proline
   c. Transamination d. Oxidation of cysteine → cystine CO4 K2

9. Which DNA form is left-handed and associated with gene regulation?
   a. A-DNA b. B-DNA c. Z-DNA d. H-DNA CO5 K1

10. What type of condition occurs due to the deficiency of vitamin C that impairs hydroxylation of proline and lysine in collagen?
    a. Rickets b. Scurvy c. Pellagra d Beriberi. CO5 K2

Part B 5 x 6 = 30

Answer ALL questions

Each answer should not exceed 400 words or two pages

11.a. Infer on water as reactant and fitness of aqueous environment.	CO1 K2
(or)	
11.b. Write a note on buffers. How it acts as foundation of life?	CO1 K3
12.a. Classify monosaccharides. Provide its structure and reactions involved.	CO2 K2
(or)	
12.b. Provide the occurrence, structure and importance of the repeating units of heparin.	CO2 K3
13.a. Explain the chemistry and characterization of simple lipids.	CO3 K3
(or)	
13.b. Describe the chemistry of biologically important mycosterol.	CO3 K4
14.a. List the physical and electrochemical properties of amino acids.	CO4 K3
(or)	
14.b. Summarize on non-protein amino acids and peptide bond.	CO4 K5
15.a. Sketch the Watson-Crick model of DNA. Discuss on it.	CO5 K3
(or)	
15.b. Outline the effect of acid and alkali on DNA and give the functions of nucleotides.	CO5 K4

Part C 5 x 12 = 60

Answer ALL questions

Each answer should not exceed 800 words or four pages

16.a. Interpret the weak interactions in aqueous systems.	CO1 K3
(or)	
16.b. List the physical properties of water molecules. Explain chemical bonding.	CO1 K4
17.a. Describe the structure and biological importance of starch.	CO2 K4
(or)	
17.b. Outline on bacterial cell wall polysaccharides and its role.	CO2 K3
18.a. Classify phospholipids. Discuss on its structure and chemical properties.	CO3 K4
(or)	
18.b. Narrate the types and structure of terpenes.	CO3 K3
19.a. Summarize on the classification and structure of standard amino acids.	CO4 K5
(or)	
19.b. Depict the structure and biological importance of glutathione and valinomycin.	CO4 K4
20.a. Illustrate the structure and types of RNA with its functions.	CO5 K4
(or)	
20.b. Infer on structure, deficiency diseases, symptoms and hypervitaminosis of fat-soluble vitamins.	CO5 K3

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