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**BRAINWARE UNIVERSITY****Term End Examination 2025-2026****Programme – B.Tech.(BT)-2024****Course Name – Biochemistry****Course Code - BTB30105****(Semester III)***Library***Brainware University**
398, Ramkrishnapur Road, Barasat
Kolkata, West Bengal-700125**Full Marks : 60****Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A**(Multiple Choice Type Question)****1 x 15=15**

1. Choose the correct alternative from the following :

- (i) Identify the major storage form of carbohydrates in animals.
 - a) Starch
 - b) Glycogen
 - c) Cellulose
 - d) Sucrose
- (ii) Identify the stage when reaction reaches equilibrium.
 - a) Reactants are exhausted
 - b) Products exceed reactants
 - c) Forward and reverse reaction rates are equal
 - d) Temperature becomes constant
- (iii) Select the measure of dissociation constant (K_d).
 - a) Binding strength
 - b) pH level
 - c) Buffer capacity
 - d) Reaction rate
- (iv) Select the type of molecules causing electrostatic interactions.
 - a) Nonpolar molecules
 - b) Oppositely charged groups
 - c) Covalent bonds
 - d) Water molecules only
- (v) Identify the difference between intra- and intermolecular forces.
 - a) Only intramolecular forces involve energy
 - b) Intermolecular forces hold atoms together in a molecule
 - c) Intramolecular forces are stronger and within molecules
 - d) Intermolecular forces are covalent
- (vi) Indicate the changes in configuration brought around by epimerization.
 - a) Multiple carbons
 - b) Non-chiral carbons
 - c) A single chiral carbon
 - d) All carbon atoms
- (vii) Identify the use of polarimetry in carbohydrate chemistry.
 - a) Measuring melting point
 - b) Measuring molecular mass
 - c) Measuring optical rotation
 - d) Measuring solubility
- (viii) Indicate the bond glucose units are linked by in cellulose.

7. Differentiate between hydrophobic and hydrophilic molecules. How do these properties affect their behavior in water? (5)
8. Describe the features of an exergonic and an endergonic reaction with examples from cellular metabolism. (5)
9. Explain the relationship between Gibbs free energy, entropy, and enthalpy in the context of a biological reaction. (5)
10. Analyze the structural features of saturated and unsaturated fatty acids and evaluate how these influence membrane fluidity and melting point. (5)
11. Evaluate the stepwise process of mitochondrial β -oxidation and analyze how the pathway contributes to ATP generation during fasting. (5)
12. Compare the physical and chemical stability of RNA and DNA. What makes RNA more susceptible to hydrolysis? (5)

OR

Evaluate the effect of temperature, pH, and solvents on the structural integrity of DNA. (5)

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