



BRAINWARE UNIVERSITY

Term End Examination 2023-2024

Programme – DMLT-2023

Course Name – Clinical Biochemistry–II

Course Code - DMLT204

(Semester II)

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) Name the disaccharide that is composed of glucose and fructose.
 - a) Sucrose
 - b) Lactose
 - c) Maltose
 - d) Galactose
 - (ii) Select the sugar that is not a polysaccharide.
 - a) Starch
 - b) Cellulose
 - c) Lactose
 - d) Glycogen
 - (iii) A person is experiencing symptoms of hypoglycemia (low blood sugar). Cite the recommended treatment to quickly raise their blood sugar levels?
 - a) Eat a high-protein meal.
 - b) Consume complex carbohydrates.
 - c) Drink water
 - d) Eat a candy bar or drink fruit juice.
 - (iv) Name the sweetest natural carbohydrate.
 - a) Glucose
 - b) Fructose
 - c) Sucrose
 - d) Maltose
 - (v) The type of linkage that connects glucose molecules in starch
 - a) Alpha-1,4-glycosidic bonds
 - b) Beta-1,4-glycosidic bonds
 - c) Alpha-1,4- and Alpha 1,6-glycosidic bonds
 - d) Beta-1,6-glycosidic bonds
 - (vi) Pick the building blocks of proteins.
 - a) Sugars
 - b) Amino acids
 - c) Nucleotides
 - d) Fatty acids
 - (vii) Enzymes are a type of protein that function as: _____. Choose the correct answer.
 - a) Energy storage molecules
 - b) Biological catalysts
 - c) Structural proteins
 - d) Transport proteins
 - (viii) Name the amino acid that is commonly used as a neurotransmitter in the nervous system
 - a) Alanine
 - b) Arginine

- c) Serine
 d) Glutamate
- (ix) Glutathione is a tripeptide that plays a key role in: _____. Choose the correct answer.
 a) Blood clotting
 b) Antioxidant defense
 c) Muscle contraction
 d) Insulin regulation
- (x) Pick the dye that is commonly used in gel electrophoresis to visualize DNA bands.
 a) Coomassie Blue
 b) Ethidium bromide
 c) Congo Red
 d) Brilliant Blue
- (xi) Identify the function of SDS in SDS-PAGE.
 a) It stabilizes proteins
 b) It reduces disulfide bonds
 c) It denatures proteins and confers a negative charge
 d) It acts as a buffer
- (xii) Identify the primary mechanism of action of allopurinol in the treatment of gout.
 a) Inhibition of uric acid synthesis
 b) Promotion of uric acid excretion
 c) Reduction of inflammation
 d) Enhancement of uric acid crystallization
- (xiii) Identify what does the R_f value represent in chromatography.
 a) The distance traveled by the mobile phase
 b) The distance traveled by the stationary phase
 c) The ratio of the distance traveled by the compound to the distance traveled by the solvent
 d) The ratio of the distance traveled by the solvent to the distance traveled by the compound
- (xiv) In thin-layer chromatography choose what does the retention factor R_f value indicate?
 a) The polarity of the compound
 b) The affinity of the compound for the stationary phase
 c) The solubility of the compound in the mobile phase
 d) The extent of migration of the compound relative to the solvent front
- (xv) Write the primary function of phospholipids.
 a) Energy storage
 b) Structural component of cell membranes
 c) Hormone production
 d) Thermal insulation

Group-B

(Short Answer Type Questions)

3 x 5=15

2. What is the difference in structure between sucrose and lactose, and how do their functions differ in plants and mammals? (3)
3. Discuss briefly about one physical property of carbohydrate. (3)
4. Define radioactive decay. (3)
5. Apply the use of electrophoresis in the process of hemoglobin electrophoresis. (3)
6. Illustrate the structure of Histidine at different pHs (3)

OR

- Estimate the significance of retention time in chromatographic analysis and its relation to compound identification and quantification. (3)

Group-C

(Long Answer Type Questions)

5 x 6=30

7. Apply your knowledge and explain how lifestyle modifications are associated with treatment of Gout. (5)
8. In a laboratory experiment of qualitative analysis of unknown biomolecule, Molisch test comes positive for your sample. Apply your knowledge and predict the possibilities from there. (5)
9. Explain the significance of membrane transport mechanisms, including passive diffusion, facilitated diffusion, and active transport, in maintaining cellular homeostasis. Provide (5)

examples of each mechanism and discuss their energy requirements.

10. Analyze how do chromatographic techniques, such as paper and thin-layer chromatography, facilitate the analysis of complex mixtures in forensic investigations? (5)
11. Write short note on AIDS and its treatment. (5)
12. Analyze the reaction with acid property of carbohydrates. (5)

OR

Analyze the relationship between dietary habits and cholesterol levels in the context of cardiovascular health. (5)
