BRAINWARE UNIVERSITY

Term End Examination 2024-2025
Programme – DMLT-2023
Course Name – Clinical Biochemistry-III
Course Code - DMLT304
(Semester III)

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) Which of the following statements about ELISA sensitivity is true?

a) Higher sensitivity means the assay can detect lower concentrations of analyte.
b) Lower sensitivity means the assay can detect lower concentrations of analyte.
c) Sensitivity does not affect the assay results.
d) Sensitivity only refers to the speed of the assay.

(ii) Select which is detected in sample in the sandwich ELISA.

a) Antibody
b) Percentage of Hb in blood
c) Antigen
d) Detection of HIV antibodies in blood sample

(iii) What is the term for the region of an antibody to which an antigen binds?

a) Paratope
b) Epitope
c) Hapten
d) Antigenic determinant

(iv) Identify the health conditions are associated with obesity.

a) Type 2 diabetes, hypertension, and cardiovascular disease
b) Asthma and allergies
c) Osteoporosis
d) Migraines and chronic fatigue syndrome

(v) Interpret why is HbA1c particularly useful in diabetes management?

a) It helps diagnose diabetes.
b) It assesses the risk of complications related to diabetes
c) It guides immediate insulin dosage adjustments.
d) It reflects long-term glycemic control.(Y

(vi) Serum creatinine levels are more reliable than urea for assessing renal function because.

a) Creatinine is affected by diet
b) Creatinine is not affected by hydration status

c) Creatinine is freely filtered and not reabsorbed
d) Creatinine levels fluctuate with protein intake

(vii) Which of the following is an indicator of kidney function in urine analysis?

a) Blood glucose
b) Urinary pH
c) Urinary osmolality
d) Urinary ketones

(viii) Identify the molecule that binds specifically to an antigen.

a) Antibody
b) Enzyme
c) Receptor
d) Hormone

(ix) Identify the main purpose of an antigen-antibody precipitation test.

a) To increase antibody levels
b) To identify the presence of soluble antigens
c) To amplify DNA sequences
d) To inhibit antigen production

(x) Identify the type of immune response involving antibodies.

a) Cellular immunity
b) Innate immunity
c) Humoral immunity
d) Adaptive immunity

(xi) List the two types of enzyme-substrate reaction models.

a) Substrate inhibition and feedback inhibition
b) Michaelis-Menten and Allosteric
c) Lock and Key and Induced Fit
d) Synthesis and Hydrolysis

(xii) Identify the enzyme used as a cardiac marker post-myocardial infarction.

a) Amylase
b) Creatine kinase (CK)
c) Pepsin
d) Urease

(xiii) Select the enzyme that converts glucose into glucose-6-phosphate.

a) Hexokinase
b) Pyruvate dehydrogenase
c) Amylase
d) Creatine kinase

(xiv) Choose the major waste product eliminated by the kidneys:

a) Urea
b) Glucose
c) Bilirubin
d) Lactate

(xv) Choose the normal range for serum potassium levels:

a) 3.5-5.0 mEq/L
b) 1.0-2.0 mEq/L
c) 6.0-8.0 mEq/L
d) 5.5-7.5 mEq/L

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Apply your knowledge of obesity and explain two diseases which are clinically related with obesity complication. (3)
3. How does gamma-glutamyl transferase (GGT) aid in assessing liver function? (3)
4. What is the importance of serum albumin levels in liver function assessment? (3)
5. Write-down the clinical significance of total bilirubin, conjugated and non-conjugated billirubin. (3)
6. Assess the use of serum lipase in the diagnosis of pancreas disease. (3)

OR

Evaluate the utility of the troponin test over creatine kinase-MB (CK-MB) in diagnosing acute myocardial infarction. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Compare and contrast between reversible and irreversible inhibitors. (5)
8. A case study presents a 30-year-old male with a history of hypertension and proteinuria. Assess the potential causes of his proteinuria and the relevance of conducting a 24-hour urine protein test. (5)
9. Write short note on enzymes for Diagnosis Pancreatic Diseases. (5)
10. Illustrate 4 types of ELISA and briefly analyze result from each process. (5)

11. Describe the pathophysiology of protein-energy malnutrition (PEM). How do marasmus and kwashiorkor differ in terms of clinical presentation and biochemical abnormalities? (5)

12. (5)

A patient with acute chest pain shows following blood values:CPK and LDH are also raised. Discuss the probable diagnosis?

Laboratory tests	Patient	Normal
Blood sugar in serum	300 mg/dL	65-110 mg/dL
Blood CHO	320 mg/dL	150-280 mg/dL
SGOT	52 KA Units	Up to 35 KA units
SGPT	28 KA units	Up to 40 KA units

OR

(5)

A 40-year-old heavy smoker with an abnormal ECG was admitted to the hospital with the complaint of severe indigestion after a meal. Laboratory findings are as follows: Explain and interpret diagnosis about this patient?

Analyte	Patient	Normal
AST	60KU/L	Up to 35KU/L
ALT	28 KU/L	Up to 40KU/L
LDH	410 KU/L	50-110KU/L

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