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Brainware University  
398, Ramkrishnapur Road, Barasat  
Kolkata, West Bengal-700125

## BRAINWARE UNIVERSITY

Term End Examination 2024-2025

Programme – M.Sc.(MLT)-2023/M.Sc.(MLT)-2024

Course Name – Clinical Biochemistry

Course Code - MMTC01002

( Semester I )

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 cardiac biomarker enzyme is considered the gold standard for diagnosing acute myocardial infarction (heart attack)?
  - a) Creatine kinase (CK)
  - b) Troponin
  - c) Lactate dehydrogenase
  - d) Aspartate aminotransferase
- (ii) This condition of chronic inflammation of the thyroid leading to under-activity is
  - a) Thyroiditis
  - b) Goitre
  - c) Hypothyroidism
  - d) Hyperthyroidism
- (iii) The main anatomical structure which produces CSF is called the
  - a) Amygdala
  - b) Cerebral Cortex
  - c) Cerebellum
  - d) Choroid Plexus
- (iv) Name the Indications for laboratory investigation of CSF?
  - a) CNS infection
  - b) Demyelinating diseases
  - c) CNS Malignancy
  - d) All of these
- (v) In the Biochemical analysis of CSF we are interested in which of the following?
  - a) Albumin
  - b) Potassium
  - c) dopamine
  - d) glucose
- (vi) In which condition is lumbar puncture not helpful in diagnosis?
  - a) Meningitis
  - b) Epilepsy
  - c) TB
  - d) Multiple sclerosis
- (vii) The biochemical investigation of the blood specimen showed Bilirubin- 4.5 mg/dl, ALT- 150 IU/L, AST- 200 IU/L, Albumin- 25 mg/dL. What is the likely biochemical diagnosis?
  - a) Hemolytic Jaundice
  - b) Acute hepatic disease
  - c) Chronic hepatic disease
  - d) Obstructive liver disease
- (viii) Which of the following is used for bacterial cell wall lysis
  - a) CTAB
  - b) Phenol extraction

- c) lysozyme  
d) peniciline
- (ix) What is the main region of the brain affected by the degeneration of neurons in Parkinson's disease?  
a) Cerebellum  
b) Substantia nigra  
c) Corpus callosum  
d) Frontal Lobe
- (x) Glucose-6-phosphate deficiency is an inherited disorder that primarily affects which organ or system in the body?  
a) Kidneys  
b) Nervous system  
c) Red blood cells  
d) Liver
- (xi) Newborn screening typically involves the analysis of blood samples to detect metabolic and genetic disorders. Identify which of the following is a primary method of collecting blood samples from newborns for screening purposes?  
a) Urine collection  
b) Saliva swabs  
c) Heel prick or heel stick  
d) Lumbar puncture
- (xii) Interleukins are signaling molecules that play a vital role in immune responses. Identify which Interleukin is associated with promoting inflammation and fever during infections?  
a) Interleukin-1 (IL-1)  
b) Interleukin-6 (IL-6)  
c) Interleukin-10 (IL-10)  
d) Interleukin-13 (IL-13)
- (xiii) Up to the age of six months, this is the ideal food for newborns and young infants  
a) soy milk  
b) rice cereal  
c) breast milk  
d) iron-fortified formula
- (xiv) A newborn infant, as part of routine is immediately assessed with this procedure after delivery  
a) infant functionality scale  
b) Apgar scoring system  
c) neonatal development scale  
d) Dubowitz-Ballard scale
- (xv) Which of the following diseases is caused by protein-energy malnutrition?  
a) angina  
b) goiter  
c) marasmus  
d) tuberculosis

**Group-B**  
(Short Answer Type Questions)

3 x 5=15

2. Apply the biochemistry involved in Alzheimer's disease
3. Predict how Biopsy samples are collected?
4. Give example of two inborn error metabolism of neonatal
5. Define the various types neurotransmitters
6. Explain the Biochemistry associated with Multiple sclerosis

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(3)  
(3)  
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(3)  
(3)

**OR**

A 45-year-old woman with a family history of diabetes presents to her primary care physician with complaints of increased thirst, frequent urination, and unexplained weight loss. She also reports feeling fatigued and occasionally dizzy. Upon examination, her blood pressure is within the normal range, and her body mass index (BMI) is 27. Blood tests reveal elevated fasting blood glucose levels and an HbA1c level of 7.5%. What is the most likely diagnosis, and what steps should be taken to manage her condition?

(3)

**Group-C**  
(Long Answer Type Questions)

5 x 6=30

7. A 45-year-old female presents to her primary care physician with complaints of increased thirst, frequent urination, unexplained weight loss, and fatigue over the past few weeks. She has a family history of type 2 diabetes, with her father and two of her siblings having



been diagnosed with the condition. She reports a sedentary lifestyle and an unhealthy diet. Physical examination reveals a body mass index (BMI) in the overweight range. Her fasting blood glucose level is 160 mg/dL. Evaluate how would you classify this patient's BMI, and what is the significance of BMI in the context of type 2 diabetes?

8. Samantha weighs 150 pounds and is 5 feet 6 inches tall. Calculate her BMI. (5)
9. Elaborate Liver function test(LFT) and its associated parameters (5)
10. Illustrate the neurobiochemistry involved in Parkinson's diseases (5)
11. Correlate the significance of Hypertension and Diabetes (5)
12. What are some commonly measured biomarkers in male infertility, and how do they help diagnose or assess male reproductive health? (5)

OR

Test the methodology of electrochemical biosensor technology involved in the early screening of alfa-fetoprotein (5)

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