  
**All India Institute of Medical Sciences, Kalyani**  
**B.Sc. MLT First Year Final Examination, August 2024**

**Time: 3 Hrs.**

**Biochemistry**

**Marks: 100**

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**INSTRUCTIONS:**

- Answer all questions.
- Illustrate your answers with well labelled diagram wherever necessary.
- Answer Biochemistry Section A & B in separate answer booklets.

**SECTION – A (40 MARKS)**

**Short or Brief Answer Questions:**

**[8×5=40]**


1. Enumerate the common types of laboratory hazards. What type of waste products should be disposed in black dustbins in the clinical lab? (3+2)
2. Enumerate the parameters measured in liver function test commonly. How from liver function test results you will identify obstructive jaundice? (2+3)
3. Classify the Vitamins. What are the major functions of vitamin A? Enumerate the clinical features of vitamin A deficiency. (2+2+1)
4. How cholesterol metabolism is regulated? What is reverse cholesterol transport? (3+2)
5. What are the biological functions of Vitamin D? What is the normal reference range of serum calcium? (4+1)
6. Define normality, molarity and molality of a solution. Calculate the normality of concentrated HCL. (1+1+1+2)
7. State the Beer's and Lambert's law in colorimetry. What is molar extinction coefficient? (3+2)
8. Name the ketone bodies produced in the body. Mention two important causes of ketoacidosis. Write the principle of Rothera's test. (2+1+2)

**SECTION – B (40 MARKS)**

**Long Answer Questions:**

**[4×10=40]**

1. Mention reference fasting & post prandial plasma glucose level. How the plasma glucose level is maintained? How you will prepare a patient for oral glucose tolerance test? What is the clinical significance of HbA1c? (2+3+3+2)
  2. Define lipid. With reference ranges enumerate the parameters commonly measure to assess lipid profile of a person. Why HDL cholesterol is known as good cholesterol? (2+5+3)
  3. Discuss the working principle, types and application of centrifugation. What are pre-analytical, analytical and post-analytical errors in a medical testing laboratory? (2+2+2+4)
  4. Mention which types of blood collection tubes you will use for the estimation of
    - a. Plasma glucose
    - b. Serum creatinine
    - c. HbA1cEnumerate the common sources of pre analytical errors. What are the advantages of bar-coding system? (3+4+3)
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Enrollment No. \_\_\_\_\_

Invigilator sign: \_\_\_\_\_

**SECTION C (BIOCHEMISTRY)**

**INSTRUCTIONS:**

- Section C (BIOCHEMISTRY) should be answered in first 20 minutes of the Exam duration and handed over to the invigilators.
- Put one Tick (✓) mark to only one answer that you consider correct for each question.
- Mark your Tick (✓) in pen.

**Multiple Choice Questions (MCQs):**

**[20x1=20]**

1. Which of the following proteins is responsible for the structural strength of bone?
  - a. Collagen
  - b. Albumin
  - c. Crystallin
  - d. Keratin
2. Measurement of the activity of what enzyme in red blood cells could be used to determine thiamine status in the body?
  - a. Transaldolase
  - b. Transketolase
  - c. Pyruvate Kinase
  - d. G6PD
3. In Electron Transport chain, electron transfer from complex I to complex III is inhibited by?
  - a. Carbon monoxide
  - b. Antimycin A
  - c. Rotenone
  - d. Malonate
4. Which of the following immunoglobulin is commonly responsible allergic manifestations?
  - a. IgA
  - b. IgD
  - c. IgE
  - d. IgG
5. In Wilson's disease, Kayser-Fleischer ring pigments at the corneo-scleral junctions are observed due to deficiency of:
  - a. Iron
  - b. Selenium
  - c. Magnesium
  - d. Copper
6. Serum lipase estimation is commonly done to diagnose
  - a. Gastritis
  - b. Myocardial infarction
  - c. Pancreatitis
  - d. Hepatitis
7. The end product of Glycolysis is always lactate in
  - a. Brain
  - b. Adrenal Glands
  - c. RBC
  - d. Adipose tissue
8. Total iron-binding capacity (TIBC) of plasma is referred to as the maximum iron binding capacity of the following protein:
  - a. Ferritin
  - b. Hemosiderin
  - c. Transferrin
  - d. Hcpidin
9. Which of the following is a specific marker of acute myocardial infarction?
  - a. AST
  - b. Troponin T
  - c. LDH
  - d. Myoglobin
10. Tight binding of tourniquet during phlebotomy can lead to abnormal value of:
  - a. Serum iron
  - b. Serum copper
  - c. Serum calcium
  - d. Serum manganese
11. For which of the following analysis sample to be protected from light?
  - a. Glucose
  - b. Creatinine
  - c. Bilirubin
  - d. Total protein

12. Pentose phosphate pathway is responsible for generating NADPH (reducing equivalents) in the cell. Which of the following enzyme is involved in generating NADPH?
- Glucose-6-P oxidase
  - Glucose-6-P dehydrogenase
  - Glucose-6-P reductase
  - Glucose-6-P synthetase
13. The Normality of 0.98% (w/v) H<sub>2</sub>SO<sub>4</sub> solution is:
- 1 N
  - 0.1 N
  - 0.2 N
  - 0.3 N
14. Fluoride inhibits
- Hexokinase
  - Phospho fructo kinase 1
  - Enolase
  - Pyruvate Kinase
15. Amino acids like ornithine and citrulline are called:
- Standard amino acids
  - Essential amino acids
  - Semi-essential amino acids
  - Non protein amino acids
16. Ketoacidosis is common in
- Renal failure
  - Pancreatitis
  - Diabetes mellitus
  - Intestinal obstruction
17. The structure of tRNA appears like a
- Helix
  - Hair pin
  - Clover leaf
  - Coil
18. Thyroid hormones are synthesized by the iodination of the amino acid:
- Glycine
  - Phenylalanine
  - Alanine
  - Tyrosine
19. Which of the following sub cellular organelle has significant role in Xenobiotic metabolism?
- Nucleus
  - Mitochondria
  - Endoplasmic reticulum
  - Peroxisomes
20. Heme is synthesized from:
- Succinyl-CoA and glycine
  - Active acetate and glycine
  - Active succinate and alanine
  - Active acetate and alanine
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