

Term End External Examination 1st Semester (Session-Feb 2025)

Subject: Clinical Biochemistry

Course No and Title: CBC122M/ Biomolecules- Metabolism and Related Disorders

Time: 2.15 hours

Max Marks:100

Min. Marks:40

Section A: Objective Type Questions

- Q1. Choose the appropriate Answer: (8x1.5=12)**
- Which product is formed at the end of glycolysis?**
 A Glucose B Pyruvate
 C Acetyl-CoA D Oxygen
 - Which enzyme is responsible for the conversion of glucose to glucose-6-phosphate in glycolysis?**
 A Hexokinase B Pyruvate kinase
 C Phosphofructokinase D Aldolase
 - Which form of DNA is the most common under physiological conditions?**
 A A-DNA B B-DNA
 C Z-DNA D C-DNA
 - What is the role of lipoproteins?**
 A Transport of glucose B Transport of lipids
 C Breakdown of fatty acids D Synthesis of proteins
 - What is the main function of cholesterol in the body?**
 A Hormone production B Energy storage
 C Cellular repair D Blood clotting
 - Which inherited disorder is characterized by urine that turns dark upon standing due to oxidation of homogentisic acid?**
 A Phenylketonuria B Alkaptonuria
 C Maple Syrup Urine Disease D Cystinuria
 - Which of the following amino acids is important in the biosynthesis of thyroid hormones?**
 A Tyrosine B Phenylalanine
 C Glutamine D Serine
 - Which of the following is a component of DNA?**
 A Adenine B Cytosine
 C Uracil D Both A and B

Section-B: Descriptive Type Questions (Short Type)

Q2: Answer all the Questions (8 x 4 =32)

- What are the fundamental characteristics of monosaccharides?
- What are Glycogen Storage Diseases?
- Describe the basic structure of triglycerides and their function in the body?
- What is the basic structural composition of an amino acid?
- Define essential fatty acids and provide one example?
- What is Alkaptonuria ?
- Could you explain the structure of a nucleotide and provide an example?
- What are the purine and pyrimidine bases present in DNA and RNA, and how do they differ in pairing?

Section – C: Descriptive Type Questions (Medium Type)

Answer all the questions: (4 x 7=28)

- Q3.** What are carbohydrates, and how can they be categorized based on their structure?
- OR**
- Explain the role of the pentose phosphate pathway in cellular metabolism?
- Q4.** Describe general structure of lipoproteins and what are types of lipoproteins?
- OR**
- How is hypercholesterolemia associated with the development of atherosclerosis?
- Q5.** How do the primary and secondary structures of proteins differ, and which of these structures is responsible for determining the tertiary structure?

OR

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How are amino acids classified, and what are the key biological functions of Phenylalanine and Tyrosine?

Q6. What is gout, and what is the connection between Adenosine Deaminase (ADA) deficiency and the development of gout?

OR

What is Lesch-Nyhan Syndrome, and what are its key symptoms?

Section – D: Descriptive Type Questions (Long Type)

Answer any two of the following: (2 x 14=28)

Q7. What is the Krebs cycle, and what are its key steps and products?

Q8. What is β -oxidation of fatty acids, and how does it contribute to energy production?

Q9. What are inherited amino acid metabolism disorders, and how does Phenylketonuria illustrate such a condition? What are the key features of this disorder?

Q10. Could you explain the detailed structure of DNA, emphasizing its components, and describe the different types of DNA?