

Roll No: _____

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B.Sc.-M.Sc. Integrated Biochemistry, Semester-IV Examination, 2023
Paper Title: Metabolism of Amino Acid and Nucleotides
Paper Code: BBC CC13

Time: 3 hours

Max Marks: 75

Note: This paper has 3 sections A, B, and C, Attempt all the three sections

Section A: Answer all the questions; Section B: Answer any 2 out of 4; Section C: Answer all the questions, each question has an internal choice

Course Learning Outcomes:

CLO-1: Understand concepts of the nitrogen cycle and nitrogen fixation by microbes and how its incorporation in the diet is critical to human nutrition as well as comprehend the mechanism by which ammonia is incorporated in biomolecules

CLO-2: Systematically learn the breakdown and synthesis of amino acids and nucleotides in humans and recognize its relevance with respect to nutrition and human diseases

CLO-3: Gain knowledge of how amino acids are converted into a variety of precursors

CLO-4: Comprehend how the amino acid and nucleotide metabolism are integrated with carbohydrate and lipid metabolism

CLO-5: Analyse and evaluate clinical parameters through hands-on training

Section A (Attempt all)

(1x10=10 Marks)

Q. No.	Questions	BTL	CLO	PLO
1	<u>Fill in the blanks with the correct choice</u>			
i.	Adenosine Monophosphate, Vitamin B5, and amino acid cysteine are precursors for the biosynthesis of _____ (Coenzyme A/NAD ⁺ /FAD/PLP)	1	2	3
ii.	The activity of which pump is absolutely necessary for the intestinal uptake of amino acids _____ (Na-H Exchange protein, Na-K ATPase pump)	3	2	3
iii.	Protein and energy deficiency in older people can cause _____ (Kwashiorkor syndrome/Marasmus syndrome)	4	5	2
iv.	Precursor of serotonin is _____ (Phenylalanine/Tyrosine/Tryptophan)	1	4	3
v.	Glycine cleavage system is involved in the biosynthesis of _____ (Proline/Arginine/Serine)	3	3	2
vi.	Ribonucleotide reductase converts which form of ribonucleotides into deoxyribonucleotides _____ (NMP/NDP/NTP)	5	4	3
vii.	Which of the following is not a true nucleotide _____ (AMP/TTP/FMN)	4	4	3

viii.	_____ is the precursor of Nicotinamide coenzymes (Phenylalanine/Tyrosine/Tryptophan)	4	4	3
ix.	Prolonged fasting will cause a significant increase of ____ in blood. (Beta-hydroxybutyrate/Glucose/Fatty acids)	2	2	3
x.	Glucogenic liver promotes _____ (Ketone Body Biosynthesis/Fatty Acids Biosynthesis/Glycogen Synthesis)	2	2	3

SECTION B: Long answer questions

(2x15=30 Marks)

Q. No. 2	Questions Attempt any two out of four	BTL	CLO	PLO
a	Give a detailed account of protein digestion in the GI tract and intestinal absorption of amino acids	3	2	3
b	Discuss the significance of the Urea cycle and strategies to counter mutations in the enzymes of the Urea cycle	5	3	2
c	Discuss the metabolism of heme	2	2	3
d	Discuss lipogenic and glucogenic liver with respect to the integration of metabolic pathways at tissue level	1	1	2

SECTION C: Short answer-type questions

(5x7=35 Marks)

Q. No. 3	Questions Attempt all, each question has an internal choice	BTL	CLO	PLO
a	What is the Glucose Alanine cycle? Discuss its importance OR Discuss the steps involved in the breakdown of amino acids	4	5	3
b	Discuss the importance of Tetrahydrofolate Cofactors OR What is the role of Creatine in Muscles	3	2	3
c	Discuss Salvage pathways of Nucleotide biosynthesis OR Discuss the functioning of Ribonucleotide Reductase	4	3	2
d	What is Gout disease? Discuss its causes. OR What is SCID? Discuss its causes	2	2	3
e	What is Purine Nucleotide cycle. Discuss its significance OR Explain with examples the importance of Suicide substrates	5	2	3
f	What are Porphyrias discuss with examples OR Discuss the biosynthesis of Catecholamines	5	2	3
g	Discuss Kwashiorkor malnutrition OR Discuss the significance of calculating Nitrogen Balance	4	2	3

END OF THE QUESTION PAPER