JHARKHAND Rai University
RANCHI

End Semester/Reappear (Semester II) Examination May 2025

Programme: B. Pharm

Course: Biochemistry **Full Marks: 75**

Course Code: BP203T **Time: 3 Hrs.**

Enrolment no. _____

Q.No.	Questions	CO	Bloom Taxonomy Category	Marks
	Section I			
1	**Objective Type Questions**			**1 x 20 = 20**
	i. Which of the following amino acids is classified as non-polar? A) Lysine B) Glutamic acid C) Alanine D) Serine ii.The function of proteins in the body includes all EXCEPT: A) Enzymatic activity B) Energy storage C) Hormone regulation D) Structural support iii.An exergonic reaction is characterized by: A) Absorption of energy B) Positive ΔG C) Release of energy D) Formation of ATP iv.The relationship between free energy (ΔG), enthalpy (ΔH), and entropy (ΔS) is given by: A) $\Delta G = \Delta H + T\Delta S$ B) $\Delta G = \Delta H - T\Delta S$ C) $\Delta G = \Delta S - T\Delta H$ D) $\Delta H = \Delta G + T\Delta S$ v. Which of the following is considered an energy-rich compound? A) NADH B) Water C) CO_2 D) Oxygen	CO1	Remember	
	vi. Which of the following enzymes catalyzes the first step of glycolysis? A) Hexokinase B) Phosphofructokinase C) Pyruvate kinase D) Aldolase vii. Glucose-6-phosphate dehydrogenase (G6PD) deficiency can lead to: A) Diabetes mellitus B) Ketoacidosis C) Hemolytic anemia D) Hyperglycemia viii.Which hormone primarily promotes gluconeogenesis? A) Insulin B) Epinephrine C) Glucagon D) Thyroxine ix.A defect in phenylalanine hydroxylase leads to: A) Albinism B) Phenylketonuria C) Tyrosinemia D) Alkaptonuria x. Unconjugated hyperbilirubinemia is typically seen in: A) Obstructive jaundice B) Hemolytic jaundice C) Hepatic jaundice D) Neonatal jaundice			
	xi.Which of the following statements about the mammalian genome is true? A) It consists only of protein-coding sequences B) Mitochondrial DNA is linear C) Most of the genome is non-coding D) All genes are always expressed xii.The genetic code is termed "degenerate" because: A) It mutates easily B) Some amino acids are encoded by more than one codon C) Codons overlap D) Codons are read backwards xiii.During translation, the start codon is typically: A) UAA B) UGA C) AUG D) UAG xiv.The IUB system classifies enzymes based on: A) pH range B) Subcellular location C) Type of reaction catalyzed D) Size and shape xv.In a Lineweaver-Burk plot, the y-intercept corresponds to: A) Km B) 1/Km C) 1/Vmax D) Vmax			
	xvi.Which of the following enzymes is used as a marker in myocardial infarction diagnosis? A) Amylase B) Creatine kinase-MB (CK-MB) C) Lipase D) Pepsin xvii.Dopamine is synthesized from which amino acid? A) Tryptophan B) Tyrosine C) Histidine D) Glutamine xviii.Cholesterol serves as a precursor for all of the following EXCEPT: A) Bile acids B) Steroid hormones C) Vitamin D D) Glycogen xix.Which condition is characterized by lipid accumulation in liver cells? A) Hypercholesterolemia B) Atherosclerosis C) Fatty liver D) Obesity xx.Which of the following acts as an uncoupler of oxidative phosphorylation? A) Cyanide B) Oligomycin C) DNP (2,4-dinitrophenol) D) Rotenone			
	Section II			
2. Short Answer type questions.				
a	Write a note on High Energy Compounds.	CO1	Understand	

b	Describe the Citric Acid Cycle (Krebs Cycle) in detail.	CO2	Remember	**7 x 5 = 35**
c	Explain the β-oxidation of fatty acids.	CO3	Remember	
d	Describe the salvage pathway of purine nucleotides.	CO4	Remember	
e	Give mechanism of enzyme catalysis.	CO5	Understand	
f	Write a note on central dogma.	CO4	Understand	
	or			
	Write a note on gene expression.	CO4	Understand	
g	Give biochemical synthesis of Melatonin and Dopamine.	CO3	Understand	
	or			
	Write a note on clinical synthesis of Ketone Bodies.	CO3	Understand	
Section III				
Long Answer Type questions				**2 x 10 = 20**
3	Illustrate the regulation of blood glucose levels by insulin and glucagon. How do these hormones influence carbohydrate metabolism in the liver and muscle tissues?	CO2	Analyze	
	or			
	Explain the process of glycogenesis and glycogenolysis. How are these processes regulated in the body, and what enzymes are involved?	CO2	Analyze	
4	Describe the metabolic basis and health implications of Hyperbilirubinaemia and Black Urine Disease (Alkaptonuria).	CO3	Evaluate	
	or			
	Explain the urea cycle, outlining its steps, biological significance, and its role in nitrogen excretion in humans.	CO3	Evaluate	

Course Outcomes (CO):

CO1: Understand the catalytic role of enzymes.

CO2: Importance of enzyme inhibitors in design of new drugs.

CO3: Therapeutic and diagnostic applications of enzymes.

CO4: Understand the metabolism of nutrient molecules in physiological and pathological conditions.

CO5: Understand the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins.