Name:

Enrolment No:

UPES

End Semester Examination, May 2025

Course: Biochemistry **Semester : II**
Program: Bachelor of Pharmacy **Duration : 03 Hours**
Course Code: BP203T **Max. Marks: 75**

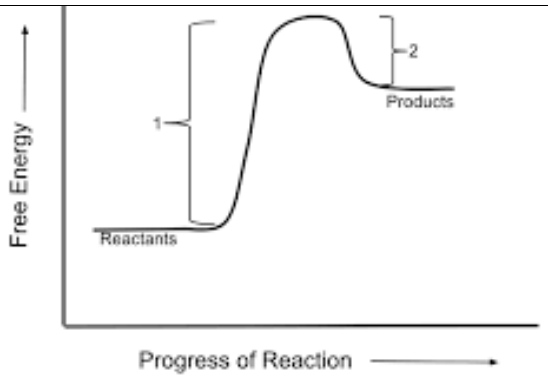
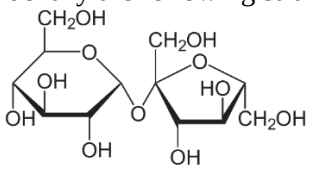
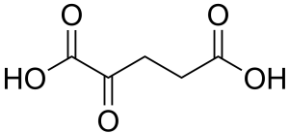
Instructions: The question paper comprises of THREE sections; all sections are compulsory.
Read the instructions before each section carefully.

SECTION A

(20Qx1M=20 Marks)

Attempt ALL Questions.

S. No.		Marks	COs
Q 1	Define carbohydrates.	**1**	**CO2**
Q 2	Which of the following is the end product of ETC and oxidative phosphorylation? a. O_2 b. NADH c. ATP+H_2O a. ADP	**1**	**CO1**
Q 3	Insulin resistance occurs in _____diabetes.	**1**	**CO2**
Q 4	State the name any two fat soluble vitamins.	**1**	**CO3**
Q 5	Which of the following is not formed in HMP shunt pathway? a. NADPH b. ATP c. Ribose a. Sedoheptulose	**1**	**CO3**
Q 6	Which of the following is a monosaccharide? a. Sucrose b. Maltose c. Dextrose a. Lactose	**1**	**CO1**
Q 7	Which of the following is true? a. Coenzyme + Apoenzyme = Holoenzyme b. Coenzyme + Holoenzyme = Apoenzyme c. Holoenzyme + Apoenzyme = Coenzyme a. None	**1**	**CO5**
Q 8	When substrate concentration is very high, V is equal to_____. a. Km b. [S] c. Vmax d. Vmax/2	**1**	**CO2**

Q 9	 The figure above represents which type of biochemical reaction? (Endergonic or Exergonic)	**1**	**CO5**
Q 10	Identify the following structure. 	**1**	**CO5**
Q 11	List **TWO** examples of phospholipids.	**1**	**CO1**
Q 12	Define beta oxidation.	**1**	**CO1**
Q 13	List **TWO** classes of amino acids based on their metabolic products.	**1**	**CO1**
Q 14	Define conjugated proteins with **ONE** example.	**1**	**CO1**
Q 15	List any **TWO** enzymes involved in the metabolism of amino acids.	**1**	**CO2**
Q 16	Define transamination reaction**.**	**1**	**CO3**
Q 17	Which of the following terms is used to describe the process by which proteins are synthesized from a genetic code? a. Reproduction b. Replication c. Translation d. Transcription	**1**	**CO4**
Q 18	List **TWO** enzymes involved in lipid metabolism disorders.	**1**	**CO5**
Q 19	List any **TWO** enzymes involved in de novo biosynthesis of pyrimidines.	**1**	**CO5**
Q 20	Identify the following structure. 	**1**	**CO5**
SECTION B (20 Marks) **(2Qx10M=20 Marks)** **Attempt 2 Question out of 3**			
Q 1	Andrew, 4-month-old male infant, was normal at birth but in the past several days tremors in his extremities appeared. Last night he presented with gross twitching movements in his crib. When the infant was examined, a musty odour was noted from the baby's wet diaper. Based on the above information,	**10**	**CO3**

	predict the underlying condition, the possible therapy, and the consequences of leaving it untreated. Justify your answer.		
Q2	A patient goes to the doctor due to frequent urination, excessive thirst, unexplained weight loss, increased appetite, blurred vision, slow-healing wounds, and fatigue. The doctor asked for laboratory investigations and found that the patient has issues related to carbohydrate metabolism. Predict the following biochemical parameters for this patient. a. Blood glucose b. HbA1c Also provide the normal range of these parameters along with their significance. Predict the possible disease condition for this patient. Propose any other lab tests that should be performed, justify your answer.	**10**	**CO1**
Q3	A 6-year-old boy is brought to the pediatrician by his parents due to concerns about aggressive behavior, delayed development, and frequent self-injurious actions such as lip and finger biting. The child also exhibits signs of hyperuricemia, including joint swelling and the presence of orange-colored crystals in the diaper. Family history reveals a maternal uncle with similar symptoms. Physical examination shows hypotonia and mild choreoathetosis. Blood tests confirm elevated serum uric acid levels. **Question:** 1. What is the most likely diagnosis? 2. What enzyme is deficient in this condition? 3. What metabolic pathway is disrupted? 4. Explain the mechanism behind the hyperuricemia in this patient. 5. Suggest a potential treatment strategy or management option.	**10**	**CO5**
SECTION-C (35 Marks) **(7Qx5M=35 Marks)** **Attempt 7 Question out of 9**			
Q 1	List the co-enzymes of following. a. Niacin b. Riboflavin c. Pyridoxine d. Thiamine e. Pantothenic acid	**5**	**CO3**
Q 2	Explain Michaelis-Menten kinetics with equation and graph.	**5**	**CO4**
Q 3	Describe competitive inhibition of enzymes with an example.	**5**	**CO2**
Q 4	List the names of two enzymes involved in: a. Liver disorders b. Heart Diseases	**5**	**CO2**
Q 5	Discuss glycogenolysis pathway.	**5**	**CO1**
Q 6	Illustrate the conversion of ornithine to citrulline in urea cycle and relate the enzymes involved in the conversion process with the disorders of urea cycle.	**5**	**CO3**
Q 7	Illustrate the fate of lipids in fasting condition using a suitable diagram.	**5**	**CO3**

Q 8	Explain the Lesh-Nyhan syndrome in relation to the disorder in the metabolism of nucleotides.	**5**	**CO4**
Q 9	Discuss the role of amino acids in gluconeogenesis and cite **FOUR** examples of glucogenic amino acids.	**5**	**CO2**