

Name:

Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, May 2023

Set 2

Course: Biochemistry

Semester: 2nd

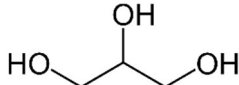
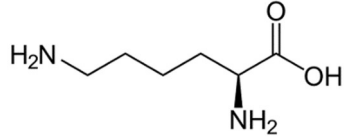
Program: B. Tech. (Biomedical Engineering)

Duration: 3 Hours

Course Code: HSCC1004

Max. Marks: 100

Instructions: Read all questions carefully.

S. No.	Section A Short answer questions/ MCQ/T&F (20Qx1.5M= 30 Marks)	Marks	COs
Q			
1	How many laws of thermodynamics are there?	1.5	CO 1
2	State any two acidic amino acids.	1.5	CO 1
3	List any two biochemical significances of carbohydrates.	1.5	CO 1
4	List any two examples of aldose sugar.	1.5	CO 1
5	Define isomerism.	1.5	CO 1
6	Draw the structure of fructose.	1.5	CO 1
7	Draw the structure of tyrosine.	1.5	CO 1
8	Name the purine nitrogenous bases.	1.5	CO 1
9	Define saponification process.	1.5	CO 1
10	Sketch the chemical structure of Lecithin.	1.5	CO 1
11	What is the mathematical relation between enthalpy and entropy?	1.5	CO 1
12	Amide bond in protein chemistry is also known as?	1.5	CO 1
13	Draw the structure of cholesterol.	1.5	CO 2
14	Recognize the molecule. 	1.5	CO 2
15	Recognize the amino acid. 	1.5	CO 2
16	What is the unit of Gibbs free energy?	1.5	CO 2
17	Give the chemical reaction of osazone formation from glucose.	1.5	CO 3
18	Draw the structure of glycogen.	1.5	CO 3

19	Draw the structure of DNA.	1.5	CO 3						
20	Illustrate the concept of allosteric inhibitors.	1.5	CO 3						
Section B (4Qx5M=20 Marks)									
21	In what part of the cell does glycolysis take place? Draw the Glycolysis Pathway.	5	CO 4						
22	Appraise the importance of DNA as genetic material.	5	CO 4						
23	Describe the enzyme kinetics at various substrate concentration (along with plot).	5	CO 5						
24	What are the 3 main products of citric acid cycle? Illustrate this cycle.	5	CO 5						
Section C (2Qx15M=30 Marks)									
25	<p>A 57-year-old patient is suffering fatigue, muscle loss and recurrent indigestion problems. The blood plasma test indicates amino acid deficiency.</p> <p>a) Give possible reasons of amino acid deficiency? (5 marks) c) Give structures of 5 essential and non-essential amino acids, respectively? (10 marks)</p>	15	CO 2						
26	<p>Early in the morning, 40 years old male patient came with complain of fatigue, weakness and blurred vision. The blood reports are included:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Lab Test</th> <th>Results</th> </tr> </thead> <tbody> <tr> <td>Fasting blood sugar</td> <td>225 mg/dL (High)</td> </tr> <tr> <td>Glycated hemoglobin (A1C)</td> <td>11.5 % (High)</td> </tr> </tbody> </table> <p>a) Which disease is indicated by the blood tests? (5 marks) b) Give biochemical explanation of hyperglycemia? (5 marks) c) What are the chronic complications with hyperglycemia? (5 marks)</p>	Lab Test	Results	Fasting blood sugar	225 mg/dL (High)	Glycated hemoglobin (A1C)	11.5 % (High)	15	CO 3
Lab Test	Results								
Fasting blood sugar	225 mg/dL (High)								
Glycated hemoglobin (A1C)	11.5 % (High)								
Section D (2Qx10M=20 Marks)									
27	Illustrate the biochemical significance and chemical nature of cyclic AMP.	10	CO 4						
28	What are the 4 types of enzyme inhibition? Describe it in detail.	10	CO 5						