LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **CHEMISTRY**

FIFTH SEMESTER – **APRIL 2025**

UCH 5601 – BIOCHEMISTRY AND NATURAL PRODUCTS

Date: 08-05-2025 Dept. No. Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

	SECTION A - K1 (CO1)	
	Answer ALL the Questions	**(10 x 1 = 10)**
1.	**Define the following**	
a)	Isoelectric point	
b)	Iodine value	
c)	Mutation	
d)	Gem-dialkyl rule	
e)	Anthocyanins	
2.	**Fill in the blanks**	
a)	Amino acids that cannot be synthesized by human body are called ____.	
b)	Prosthetic groups are ____.	
c)	The process where α-D-glucose and β-D-glucose interconvertion in solution is known as _____	
d)	$-OCH_3$ group is determined by _____ method of analysis.	
e)	Delphinidin chloride is extracted from _____ flowers.	
	SECTION A - K2 (CO1)	
	Answer ALL the Questions	**(10 x 1 = 10)**
3.	**Match the following**	
a)	Denaturation - flavonoids	
b)	Auto-oxidation - codon	
c)	Genetic code - destruction of protein's three dimensional structure	
d)	Shinoda test - terpenoids	
e)	Steam distillation - oxidation by oxygen at ambient temperature	
4.	**State True or False**	
a)	Amphoteric character indicates that a substance can act both as an acid and as a base.	
b)	Isoenzymes are enzymes that facilitate different biological functions.	
c)	DNA replication is the biological process of producing two identical replicas of DNA from one original RNA molecule.	
d)	Alkaloids cannot be obtained from animal origin.	
e)	All anthocyanins are derivatives of flavylium chloride.	
	SECTION B - K3 (CO2)	
Answer any TWO of the following		**(2 x 10 = 20)**
5.	Write the classification of proteins with examples.	
6.	Describe the chemical properties of lipids.	
7.	(a) Illustrate the Haworth structure of α-D- and β-D-glucose.	(6)
	(b) How are alkaloids classified based on structure?	(4)
8.	(a) Write the structural elucidation of coniine with its synthesis.	(5)
	(b) Write any two general methods of extraction of terpenoids.	(5)

SECTION C – K4 (CO3)		
Answer any TWO of the following		**(2 x 10 = 20)**
9.	Describe the primary and secondary structures of protein.	
10.	(a) Analyse the steps involved in the β–oxidation of fatty acids.	(5)
	(b) Compare the structural features and functions of DNA and RNA.	(5)
11.	Write the structural elucidation of citral with a simple method of its synthesis.	
12.	(a) How are anthocyanins identified by colour reactions?	(5)
	(b) Write the synthesis of hirsutidin chloride.	(5)
SECTION D – K5 (CO4)		
Answer any ONE of the following		**(1 x 20 = 20)**
13.	(a) Discuss the following synthetic methods of amino acids.	(5+5)
	(i) Gabriel phthalimide synthesis (ii) Strecker synthesis	
	(b) Evaluate the significance of different types of enzyme inhibitions.	(10)
14.	(a) Discuss the Hoffmann exhaustive methylation, and von Brown methods of degradation of alkaloids.	(7)
	(b) Explain classification of terpenoids with suitable examples.	(6)
	(c) Write the structural elucidation of cyanidin chloride.	(7)
SECTION E – K6 (CO5)		
Answer any ONE of the following		**(1 x 20 = 20)**
15.	(a) Discuss the C- and N-terminal analysis of protein.	(10)
	(b) Examine the steps involved in protein biosynthesis.	(5)
	(c) Describe the steps involved in TCA cycle.	(5)
16.	(a) Describe the industrial synthesis of camphor.	(5)
	(b) Write the structural elucidation of piperic acid.	(7)
	(c) Write short notes on the following.	(4+4)
	(i) Tannins (ii) Pelargonin chloride	
