LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

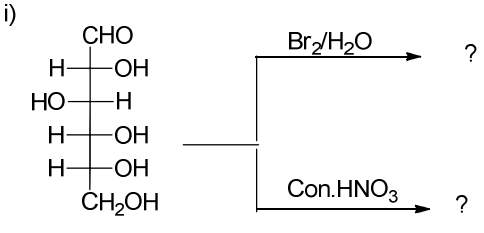
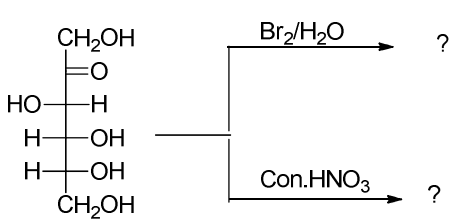
M.Sc. DEGREE EXAMINATION – **CHEMISTRY**

SECOND SEMESTER – **APRIL 2023**

PCH2ME01 – BIOMOLECULES AND NATURAL PRODUCTS

Date: 10-05-2023 Dept. No. Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

	SECTION A – K1 (CO1)	
	Answer ALL the questions	**(5 x 1 = 5)**
1.	**Answer the following**	
a)	What happens when D-glucose reacts with methanol in the presence of HCl?	
b)	Write the structure of cortisone.	
c)	State Chargaff's Rule.	
d)	Give the structure of morphine and mention two of its functions.	
e)	State special isoprene rule.	
	SECTION A – K2 (CO1)	
	Answer ALL the questions	**(5 x 1 = 5)**
2.	**Answer the following**	
a)	Why is sucrose considered as a non-reducing sugar?	
b)	What are hormones?	
c)	Name the sugars found in nucleic acid.	
d)	Write any one characteristic test for alkaloids.	
e)	Mention the biological importance of terpenoids.	
	SECTION B – K3 (CO2)	
	Answer any THREE of the following	**(3 x 10 = 30)**
3.	(a) Account for the chemical properties of lactose. (5 marks) (b) Outline the mechanism of osazone formation in maltose. (5 marks)	
4.	(a) List out the classification of hormones. Cite an example for each classification. (5 marks) (b) Draw the structures of adrenaline and thyroxin. Mention their functions. (5 marks)	
5.	(a) Differentiate DNA from RNA. (5 marks) (b) Explain the method involved in ultra-filtration. (5 marks)	
6.	(a) Elucidate the structure of cocaine. (5 marks) (b) Discuss the synthesis of heptaphylline. (5 marks)	
7.	Illustrate the structure determination of camphor. (10 marks)	
	SECTION C – K4 (CO3)	
	Answer any TWO of the following	**(2 x 12.5 = 25)**
8.	(a) Complete the following reactions. (4 + 4) i)  ii) 	

	(b) Explore the classification of carbohydrate with suitable examples. (4.5)
9.	(a) Give the occurrence and biological importance of steroids. (6 marks) (b) How is Diel's hydrocarbon synthesized? (6.5 marks)
10.	Describe the structural elucidation and synthesis of Papverine.
11.	(a) Discuss any five general methods that are used in the structural determination of terpenoids. (5.5 marks) (b) Write a method of synthesis of atropine. (7 marks)
	SECTION D – K5 (CO4)
	Answer any ONE of the following **(1 x 15 = 15)**
12.	(a) Give a brief outline regarding the structures of starch and cellulose. (8 marks) (b) Outline the mechanism of color reactions of steroids. (7 marks)
13.	(a) Illustrate the steps involved in the replication of DNA. (9 marks) (b) Describe the significance of fluorescently labelled proteins. (6 marks)
	SECTION E – K6 (CO5)
	Answer any ONE of the following **(1 x 20 = 20)**
14.	(a) What happens when glucose is treated with Benedict's solution? Explain its mechanism. (5 marks) (b) Give the biosynthesis of cholic acid and lithocholic acid from cholesterol. (10 marks) (c) Draw the Haworth projection, Fischer projection and chair conformation for sucrose. (5 marks)
15.	(a) Explain the transcription process of enzyme catalysed synthesis of DNA and RNA. (12 marks) (b) Discuss the role of olefinic reagents and oxidative degradation in determining the structure of alkaloids. (8 Marks)

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