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M.Sc. Chemistry, Semester- III
Supplementary Examination-April, 2024

Paper Title: Chemistry of Natural Products - I

Paper Code: MCHCCO - 301

Time: 2.5 hours

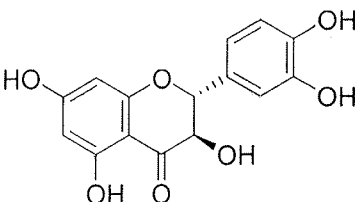
Maximum Marks: 60

Note: This paper has 3 sections A, B, and C, Attempt all three sections; **Section A:** Answer *all* the questions; **Section B:** Answer *any 2* out of 4; **Section C:** Answer *all* the questions, each question has an *internal choice*

Abbreviations Used

CLO- Course Learning Outcome, PLO- Program learning Outcome, BTL- Bloom Taxonomy Level: BT level 1-Remember; BT level 2-Understand; BT level 3-Apply; BT level 4-Analyse; BT level 5-Evaluate, BT level 6-Create

Q.No		BTL	CLO	PLO
	SECTION - A			
	Attempt <u>all</u> questions	1 x 15 = 15 Marks)		
A 1.	How many isomeric forms does α -Terpineol exist in? Write the names of the isomers.	2-3	2-3	2-3
A 2.	Differentiate between terpenes and terpenoids	2-3	2-3	2-3
A 3.	Write the structure of santonin and number its carbon atoms.	2-3	2-3	2-3
A 4.	Name the precursors from which monoterpenes and sesquiterpenes are produced.	1-3	1-3	1-3
A 5.	What is the fundamental framework (skeleton) of all steroids?	1-2	1-2	1-2
A 6.	How many asymmetric carbon atoms exist within the steroid nucleus, and could you specify their positions within the nucleus?	1-3	1-3	1-3
A 7.	In steroids, the fusion of rings A and B can occur in either a cis or trans configuration. Could you clarify which configuration is true for 5α and 5β ?	2-4	2-4	2-4
A 8.	What is the name of the alkaloid that exhibits a yellow colour?	1	1	1
A 9.	What are the products formed upon the hydrolysis of Hirsutin chloride?			
A 10.	How many absorption bands are exhibited by flavonoids? Give their λ_{max} range.	1	1	1
A 11.	What is "opium".	1	1	1
A 12.	How do morphine and codeine differ from one another?			
A 13.	What is the product formed when nicotine undergoes oxidation with chromic acid?	1-3	1-3	1-3
A 14.	Give one colour test of flavonoids?	1	1	1

A 15.	Identify the following structure	1-4	1-4	1-4
				

SECTION – B				
Attempt <i>any two</i> out of following four questions		(10 x 2 =20 Marks)		
B 1.	Give a detailed classification of either terpenoids or flavonoids with suitable examples.	2-4	2-4	2-4
B 2.	Explain Hofmann exhaustive methylation and its applications?	2-4	2-4	2-4
B 3.	Describe the nomenclature of alkaloids. Give two tests of alkaloids. Explain briefly how true alkaloids differ from proto alkaloids and pseudo alkaloids?	3-6	3-6	3-6
B 4.	Discuss the biosynthesis of either cholesterol or terpenoids.	4	4-6	4-6
SECTION – C				
Attempt <i>all</i> questions, each question has an <i>internal choice</i>		(5 x 7 = 35 Marks)		
C 1.	Explain isoprene rule with suitable examples. Sketch the synthesis of menthol either from myrcene or piperitone? OR Explain the structure elucidation of nicotine.	2-4	2-4	2-4
C 2.	Discuss the linkage between quinic acid and meroquinine in quinine? OR Discuss the position of double bonds in Abietic acid?	3	3	3
C 3.	How are steroids related to Diel's hydrocarbon ? Explain Blank's rule with suitable examples? OR How will you convert cholesterol into testosterone?	3-6	3-6	3-6
C 4.	How is the structure of progesterone established? OR Discuss the use of UV spectroscopy in the structure determination of flavonoids	4-5	4-5	4-5
C 5.	What are isoflavones and how are they different from flavones? Discuss the role of isoflavones as phytoestrogens. OR Sketch the synthesis of Daidzein by any one method.	5	5	5

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