

Department of Chemistry
School of Chemical & Life Sciences, Jamia Hamdard
B.Sc.-M.Sc. Integrated Program, Chemistry,
Semester-IV Supplementary Examination-September, 2023
Paper Title: Organic Chemistry-III: Heterocyclic and Natural Product Chemistry
Paper Code: BCH-CC09TH

Time 3 hours

Maximum Marks 75

Abbreviations Used

CLO- Course Outcome, PLO- Program 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

Section A

Very Short Type Questions (attempt all)

(10x2=20Marks)

Q. No	Question	BTL	CLO	PLO
A1.	How do you convert Adenine to hypoxanthine?	1	1	1
A2.	How many hydrogen bonds does a Guanine form with Cytosine?	4	2	1/2
A3.	The phosphate group joins the -----carbon of one pentose sugar and the -----carbon of another pentose.	1	2	2/3
A4.	What are alkaloids?	1	3	3
A5.	Define the isoprene rule.	3	2	2
A6.	What is Emde's modification?	1	4	3/4
A7.	What is Chichibabin reaction?	4	1	1
A8.	Write the structure of Adenosine.	2/4	2/4	3
A9.	Write any two identification tests of terpenoids.	1	2	1-2
A10.	Why the nucleic acids called acids?	2	5	3-5

Section B

Long Type questions (Attempt any two out four)

(10x2=20 marks)

Q. No	Question	BTL	CLO	PLO
B1.	Outline the suitable route for the synthesis of Adenine and Guanine	6	2/3	3
B2.	Explore the following reactions for the synthesis of furan, pyrrole and thiophene: (i) Pall-Knorr Synthesis (ii) Knorr Synthesis (iii) Hantzsch synthesis	3/5	5	4/5

- B3.** Sketch the suitable mechanism for the following reactions: 2/4 2-4 3-5
 (i) Fischer Indole synthesis
 (ii) Skraup synthesis
 (iii) Pictet Spengler reaction
- B4.** Discuss the structural elucidation of citral. 6 6 6

Section C

Short Type questions. (Attempt all questions)

(7x5=35 marks)

Q.NO	Questions	BTL	CLO	PLO
C1.	Discuss the connectivity of phosphate groups in a sugar-phosphate backbone. OR Differentiate between Hofmann elimination and Emde degradation with suitable examples. Specify the limitation of Hofmann elimination.	3/4	2/4	3
C2.	Justify the aromatic character of pyrroles. OR Draw the total synthesis of Nicotine.	4/5	2/3	2/5
C3.	Explain briefly the structural features of Morphine and it's medicinal importance. OR Explain briefly about the Watson & Crick's model of DNA.	2/3	2/5	4
C4.	Discuss the classification of terpenes. OR Describe the medicinal importance of Quinine and Reserpine.	3/4	3-5	5/6
C5.	Why pyridine undergoes nucleophilic substitution much more readily than benzene? OR Discuss the electrophilic substitution reactions of Indole	2	6	2
C6.	Explain the synthesis of Uracil from barbituric acid OR How is the presence of double bond and tertiary hydroxyl group established in α -terpineol.	6	4/6	3
C7.	Explain the Bischler-Napieralski synthesis of isoquinoline with suitable mechanism: OR Sketch the synthesis of Hygrine.	3/4	3-5	3/4

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