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May-2026

B.Sc. Chemistry IVth SEMESTER

ORGANIC CHEMISTRY-III

(BCH-402)

Time: 3 Hours] [Max. Marks : 75

Instructions :

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
2. *Answer any four questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

PART—A

1. (a) Write down any two methods of preparation of nitoalkanes. (1.5)
   (b) What is Balz-Schiemann reaction. (1.5)
   (c) Write down the chemical test to detect primary aromatic amine in an organic compound. (1.5)
   (d) Write down the synthesis of naphthalene. (1.5)
   (e) Discuss the regioselectivity of electrophilic substitution reaction on pyridine. (1.5)

(f) Draw the product formed by reaction of indole with acetyl chloride in presence of $SnCl_4$. (1.5)

(g) Write down the product formed when pyridine is treated with KNO_3 and H_2SO_4 at 300°C. (1.5)

(h) Write down the structure of morphine. (1.5)

(i) What do you understand by Hoffmann's exhaustive methylation ? (1.5)

(j) Write down Madelung synthesis. (1.5)

PART–B

2. (a) Discuss isoprene rule in detail. (5)

(b) Discuss Pomeranz-Fritsch reaction and its importance. (5)

(c) Discuss the chemical properties of anthracene. (5)

3. (a) Write down atleast two methods for the synthesis of nitro compounds. (5)

(b) Write down the method of preparation of benzene diazonium chloride giving suitable mechanism. (5)

(c) Describe the chemical methods used to differentiate primary, secondary, and tertiary amines. (5)

4. Write down the following reactions giving suitable mechanism :

(i) Mannich reaction.

(ii) Sandmeyer reaction.

(iii) Hoffmann's exhaustive methylation. (5×3=15)

5. (a) Discuss the structure elucidation of naphthalene. Also describe its methods of preparation and chemical properties. (10)

(b) Discuss the preferred sites of electrophilic attack in pyrrole and isoquinoline, and explain the factors governing the orientation of the incoming electrophile. (5)

6. Explain the following name reactions giving suitable mechanism :

(i) Bischler-Napieralski reaction.

(ii) Pictet-Spengler reaction.

(iii) Paal-knorr synthesis of pyrroles. (5×3=15)

7. (a) Draw the structure of quinine and explain its medicinal properties. (5)

(b) Discuss the structural elucidation Citral. Also give its chemical synthesis. (10)