

Seat
No.

M.Sc. (Part - II) (Semester - IV) (CBCS) Examination, March - 2023

ORGANIC CHEMISTRY**Theoretical Organic Chemistry (Paper - XIII)****Sub. Code : 81564/86729**

Day and Date : Monday, 12 - 06 - 2023

Total Marks : 80

Time : 10.30 a.m. to 1.30 p.m.

- Instructions :
- 1) Attempt in all five questions.
 - 2) Section - I is compulsory.
 - 3) All questions carry equal marks.
 - 4) Answer to the all questions (Section - I, II, III) should be written in the same answer book.
 - 5) Figure to the right indicate marks.
 - 6) Attempt at least two questions from Section - II and any two questions from Section - III.
 - 7) Use of log table and calculator is allowed.

SECTION - I

Q1) Answer the following:

[16]

- a) What is the main purpose of green chemistry principles?
- b) What are renewable feedstocks?
- c) Mention the names of any two ionic liquids?
- d) Which biopolymers are used in biodegradable plastic bags?
- e) State True or False:

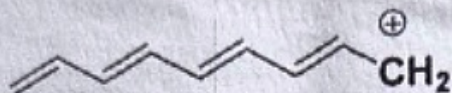
Thermodynamically controlled reactions offer more stable product due to reversibility.

- f) Which product predominates on sulphonation of naphthalene at 80°C?
- g) Mention any one factor that favours thermodynamic enolate.
- h) What is non-classical carbocation?

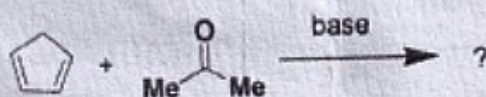
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M.Sc. II
Semester IV
(2022-23)

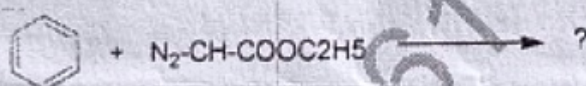
- i) How many bonding molecular orbitals, non-bonding molecular orbitals and antibonding molecular orbitals are present in cycloheptatriene?
- j) Comment on aromaticity of tropylium cation
- k) Calculate the charge density in the following molecules.



- l) What is delocalization energy of cyclopentadienyl cation?
- m) Write the product of following reaction.



- n) Write the product of following reaction.



- o) Define catenanes.
- p) State true or false: Azulene undergoes electrophilic as well as nucleophilic substitution reactions.

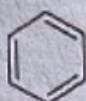
SECTION - II

- Q2) a) Using perturbational molecular orbital theory, calculate the reactivity index (NE) when naphthalene undergoes SE reactions at position 1 and 2. [10]
- b) State and explain Huckels rule of aromaticity. [6]
- Q3) a) What is green chemistry? Explain twelve principles of green chemistry citing appropriate examples. [10]
- b) Write a note on ionic liquids. [6]

- Q4) a) Give an account on various methods used for the preparation of diazocyclopentadiene. [8]
 b) Explain various physical and chemical properties of fulvenes. [8]

SECTION - III

- Q5) a) Explain various physicochemical properties of ferrocene. [8]
 b) Calculate the delocalization energy in benzene (I) and cyclooctatetraene (II). [4]

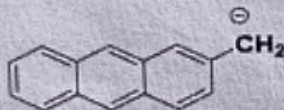


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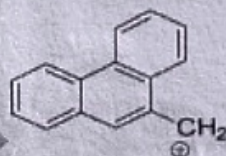


II

- c) Determine the charge density in the following: [4]



I



II

- Q6) a) Explain kinetic and thermodynamic control in Diels-Alder reaction and Wittig reaction. [10]
 b) Write a note on a non-classical carbocation. [6]

- Q7) Write notes on any four: [16]

- Microwave assisted synthesis
- PMR spectra of [14] annulene
- Kinetic and thermodynamic control in sulphonation of naphthalene
- Alternant and non-alternant hydrocarbons
- Green synthesis

