

Your Roll No.-----

B.Sc.-M.Sc. INTEGRATED PROGRAM (CHEMISTRY)

SEMESTER-II EXAMINATION -2022

PAPER CODE: BCH-CC5TH

PAPER TITLE: HYDROCARBONS

ORGANIC CHEMISTRY-I

Time: Three hours

Maximum marks: 75

(Write your Roll No. On the top immediately on receipt of question papers)

Attempt all questions. All parts of a question must be attempted in continuation. Start Answer of a fresh question on a new page. Cite examples and draw labelled diagrams wherever necessary.

Q1. Answer the following questions very briefly: [10x1.5=15]

- a. Give one example of Grignard reagent in preparation of alkane?
- b. What is Regio-chemistry?
- c. Naphthalene is Aromatic in nature. Explain briefly with the help of Huckel's Rule.
- d. Give the structures of any 3 polynuclear hydrocarbons.
- e. Give one example of Friedel-Craft's Acylation Reaction.
- f. State the difference between Carbanion and Carbocation. Give one example each.
- g. What do you mean by Wurtz Reaction?
- h. What is Markownikoff and Anti-markownikoff addition?
- i. Calculate the symmetry elements in Phenanthrene.
- j. State two differences each between E1 and E2 elimination reactions. Also, give one example for each.

Q2. Attempt **ANY THREE** of the following: [3x5=15]

- A. Explain the Structural Elucidation of Naphthalene. Give the synthetic preparation of Anthracene.
- B. What is Huckel's Rule? Explain with the help of suitable examples. Anthracene is aromatic in nature, explain with the help of Huckel's rule.
- C. Give the preparation/synthesis of Phenanthrene. Why is Phenanthrene more stable than anthracene.

- D. Explain the Baeyer Strain Theory with suitable examples.
- E. What are the products formed in the Hofmann Elimination Reaction? Give the mechanism of action of Hofmann Elimination Reaction.

Q3. Attempt **ANY THREE** of the following:

[3x5=15]

- A. What is the difference between Wurtz reaction and Wurtz Fittig Reaction? Give reactions for each.
- B. What do you mean by polynuclear hydrocarbons and their aromaticity. State the properties and synthetic preparation of Naphthalene.
- C. Give the Huckel's Rule for the following:
- Benzene
 - Furan
 - Pyrrole
 - Cyclobutadiene
 - Pyridine
- D. Explain the conformational analysis of alkanes by giving suitable examples. Give the nitration reaction for any one alkane.
- E. What do you mean by Oxymercuration-demercuration reaction? Give the reaction mechanism for the same.

Q4. Attempt **ANY THREE** of the following:

[3x5=15]

- A. Benzene is aromatic whereas Cyclohexane is non-aromatic; Explain and give the Huckel's rule for both. What are cyclic carbocations? Give two examples.
- B. What is the energy of cyclohexane? Explain the energy diagram of cyclohexane.
- C. Give the Structural Elucidation of Anthracene and Phenanthrene.
- D. Give the reaction mechanism of Friedel Craft's Alkylation reaction. Give two Examples.
- E. Give the one reaction for allylic bromination and benzylic bromination. Explain the reaction mechanism of each.

Q5. Attempt ANY THREE of the following:

[3x5=15]

- A. Write the order of halogenation of alkanes in the presence of heat or UV light. Unlike halogenation of alkanes with Cl, Br and I, why is the fluorination of alkanes not carried out directly with pure fluorine?
- B. Give two reaction pathways with which we can carry out sulphonation of alkanes. Write the mechanism of sulphonation of alkanes. Give two examples.
- C. What do you mean by a terminal alkyne? Give the mechanism for the alkylation of terminal alkynes. Give two examples of terminal alkylation reactions.
- D. Explain Five reactions by which alkanes can be prepared.
- E. Briefly explain the following terms/reactions:
- Hydroboration-oxidation
 - Ozonolysis
 - Conjugated Dienes
 - Syn and Anti-hydroxylation
 - Diels Alder Reaction
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