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Total No. of Printed Pages: 2

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B.Sc. (Forensic Science) (Semester – 1st)

ORGANIC CHEMISTRY-I

Subject Code: BSNMS1-104

Paper ID: 23480105

Time: 03 Hours

Maximum Marks: 60

Instruction for candidates:

1. Section A is compulsory. It consists of 10 parts of two marks each.
2. Section B consist of 5 questions of 5 marks each. The student has to attempt any 4 questions out of it.
3. Section C consist of 3 questions of 10 marks each. The student has to attempt any 2 questions.

Section – A

(2 marks each)

Q1. Attempt the following:

- a. Define the term hybridization. Is it necessary that hybridization must be proceed by electron promotion?
- b. State Huckel's Rule of Aromaticity.
- c. Allyl free radical is more stable than alkyl free radical, Explain.
- d. Using Baeyer's strain theory, calculate angle strain in cyclohexane and cyclopentane
- e. Write a brief note on Banana bonds.
- f. Describe Diel's-Alder reaction with example
- g. Discuss the mechanism of allylic substitution in propene
- h. What is Friedal Craft reaction? Discuss with mechanism.
- i. Justify the statement 'cyclohexatriene is different from benzene'
- j. Outline the mechanism of sulphonation of benzene.

Section – B

(5 marks each)

- Q2. (a) Give some methods for the formation of carbocations
(b) Compare the stability of primary, secondary, and tertiary Carbocations. Explain your answer with examples. **(2,3)**
- Q3. (a) Discuss Kolbe reaction and decarboxylation of carboxylic acids for the formation of alkanes
(b) What is Wurtz reaction? Discuss its advantages as well as its limitations. **(3,2)**
- Q4. Explain why alkynes show electrophilic as well as nucleophilic addition reactions. **(5)**
- Q5. Give the method of preparation of benzene: (i) From phenol (ii) From acetylene (iii) From benzene sulphonic acid. **(5)**
- Q6. Discuss briefly the various factors which affect the stability of (i) carbocation (ii) carbanion and (iii) free radicals. **(5)**

Section – C

(10 marks each)

- Q7. (a) Differentiate between singlet and triplet carbenes. Explain their structure and why triplet carbenes are more stable than triplet carbenes.
(b) Explain the method of assigning formal charge on reaction intermediates. Illustrate it by assigning formal charge on (i) Carbene (ii) Carbocation **(5,5)**
- Q8. (a) What is meant by orientation in halogenation of alkanes? On what factors does it depend? Explain with examples.
(b) Write short note on reactivity and selectivity of alkanes in the halogenation reaction **(5,5)**
- Q9. (a) How do alkenes show the following properties: (i) Hydroboration-oxidation (ii) Epoxidation (iii) Polymerisation?
(b) Acid catalysed dehydration of neopentyl alcohol produces two alkenes. Give their structure and propose a suitable mechanism for their formation. Which of these alkenes, do you think shall be the major product and why? **(6,4)**