Roll No…….. **Total No. of Printed Pages: [02]**
Total No. of Questions: [09]

B.Sc.- M.Sc. (Forensic Science) (Semester – 2nd)
ORGANIC CHEMISTRY-II
Subject Code: BSNMS1204
Paper ID: [23480113]

Time: 03 Hours **Maximum Marks: 60**

Instruction for candidates:

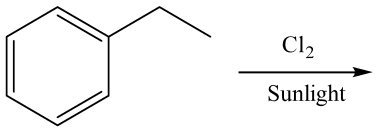
1. Section A is compulsory. It consists of 10 parts of two marks each.
2. Section B consist of 5 questions of 5 marks each. The student has to attempt any 4 questions out of it.
3. Section C consist of 3 questions of 10 marks each. The student has to attempt any 2 questions.

Section – A **(2 marks each)**

Q1. Attempt the following:

a) Justify why KNO_2 and $AgNO_2$ give different products upon treatment with ethylchloride.

b) Predict the major product for the following reaction:



c) What are the limitations of Kekule structure?

d) Draw the Wedge, Fischer, Newmann & Saw-Horse representations for tartaric acid.

e) Explain the terms chirality and optical activity.

f) What is meant by electrophilic addition reaction?

g) What are the necessary conditions for any compound to be aromatic?

h) When two moles of ethyl chloride react with two moles of sodium in the presence of ether what will be formed?

i) What are activating and deactivating groups?

j) Draw the E- & Z- isomers of 2-butene.

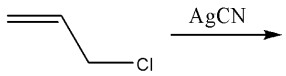
Section – B **(5 marks each)**

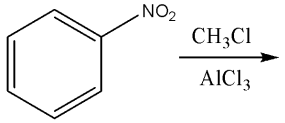
Q2. What are ‘R’ and ‘S’ configurations? State and explain sequence rules with examples.

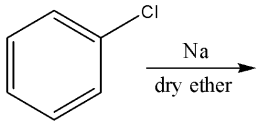
Q3. When alkyl halides are treated with aqueous $AgNO_3$, silver halide precipitate and an alcohol is formed. From what you know about the SN1 reaction, propose a mechanism for the following conversion.

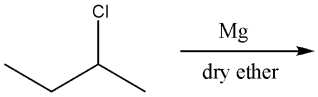
Q4. Why Methoxy benzene is ortho-para directive in Electrophilic aromatic substitutions? Explain.

Q5. Complete the following:

i) 

ii) 

iii) 

iv) 

Q6. Give the mechanism of any two of the following reaction in benzene:

i) Nitration
ii) Halogenation
iii) Sulphonation
iv) Friedel-Crafts acylation

Section – C **(10 marks each)**

Q7. a) Explain the various possible conformation of n-butane using Newman projections. Also give their energy diagram. 6,4

b) How E/Z system of nomenclature differs from cis/trans.

Q8. a) Write the mechanism for nitration and Friedel Craft alkylation of Benzene. 6,4

b) What is the role of sigma and pi complexes in aromatic substitution reactions of benzene.

Q9. Describe SN_1 and SN_2 reaction mechanisms and give evidence in support of their mechanism.