

Sem. III O.C. I
Second Half 2014

(3 Hours)

QP Code : 13716

N.B.: 1. All questions are compulsory

Total Marks: 70

2. Figures to right indicate full marks

Q1] A] Answer the following questions

(12)

a. Assign E/Z or R/S or D/L notations and name the following molecules as per IUPAC rules (Any Two):



b. Give suitable structures for the following compounds (Any Two):

- i. 2-Hydroxyethylpentanecarboxamide
- ii. 4-Methylbenzenesulfonic acid
- iii. Ethyl 2-methylpropanoate

c. Draw possible resonance structures for the following compounds Anisole and phenol

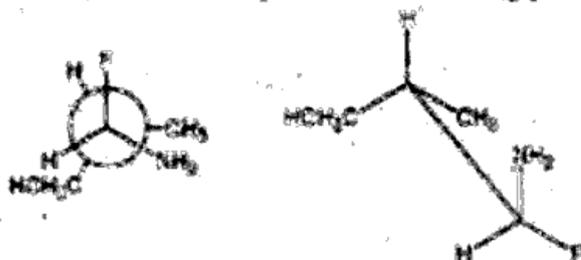
d. Rank the order of basicity for the following organic compounds and justify



e. Rank the order of acidity for the following alcohol protons (-OH) and justify

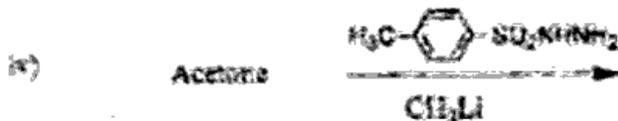


f. Establish the relationship between following pair of molecules

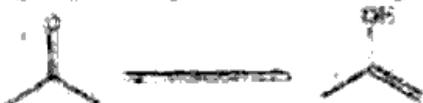


B] Give the products of the following reactions (Any Three):

(03)



Q2.A) Identify the tautomeric system existing in the following pair of molecules (02)

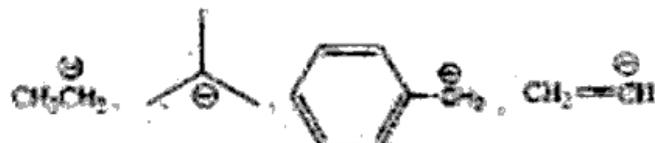


B) Identify all the nucleophiles in the given reaction (01)



C) Answer the following questions: (06)

i) Arrange the following sets of carbanions in increasing order of stability and justify the same



ii) Explain the stereochemistry of hydroxylation of trans-2-butene using osmium tetroxide.

iii) Give the structures of A and B in the following reaction:



D) Complete the following table: (03)

	Example of the nucleophile	Type of solvent	Example of ideal solvent
S _N 1 reaction			
S _N 2 reaction			

Q.3 A) What are mesomers? Are they optically active? Give suitable example. (02)

B) Represent 2(S), 3(S)-2,4-Dihydroxy-3-nitrobutanal using various projection formulae. (02)

C) What is Saytzeff's rule? Give the mechanism for dehydrohalogenation reaction of isopentyl bromide using alcoholic sodium hydroxide. (04)

D) Give probable structures for the following (04)

i) An alkene yielding 2 moles of acetone on ozonolysis

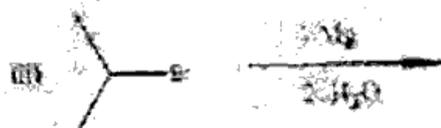
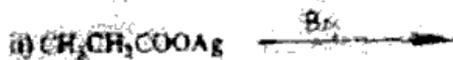
ii) A product obtained on addition of HBr to Propene

iii) An alkene obtained on dehydration of 2-Methyl-2-butanol

iv) A product obtained on addition of isobutane to isobutylene in presence of acid catalyst

Q4 A) Discuss the orientation and reactivity of the -OPI group towards electrophilic aromatic substitution. (03)

- B) Give the mechanism for sulfonation of acetanilide. (02)
 C) Bring about the following conversions. (Any Two) (04)
 i) Propyne to 2-pentyne ii) t-butylbromide to 3-Bromo-2-methylpropene
 iii) 1-Butene to 2-Butene
 D) Give the product for the following reaction (Any Three) (03)

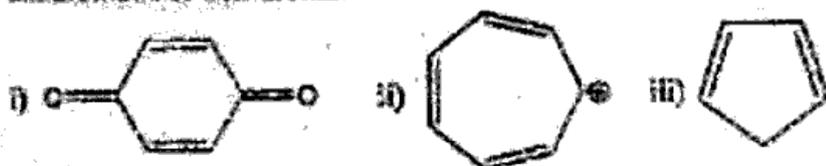


Q5A) Explain the following terms (02)

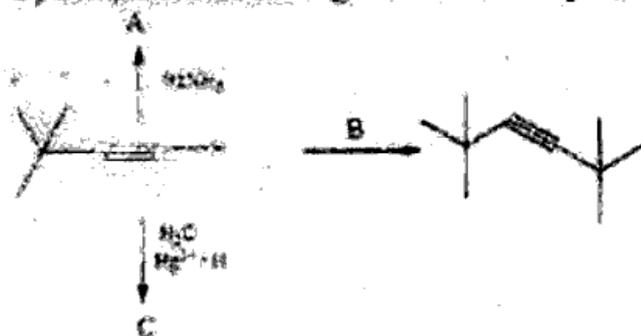
- i) Configuration ii) Enantiomer
 B) Identify whether the following molecules are chiral or achiral. Justify (02)



- C) Both m-bromoanisole and o-bromoanisole yield m-anisidine on reaction with sodamide and liquid ammonia. Give the mechanism of formation of the product and justify the same. (03)
 D) State Huckel's rule for aromaticity. Identify whether the given molecules are aromatic, antiaromatic or non-aromatic. (04)



- Q.6 A) What do you think is more stable: 1, 3-pentadiene or 1, 4 pentadiene and why? (02)
 B) Define and discuss with suitable example a concept of stereospecific and stereoselective reactions. (02)
 C) Arrange 1-bromobutane, 1-bromo-2,2-dimethylpropane, 1-bromo-2-methylbutane, 1-bromo-3-methylbutane in the order of reactivity toward S_N2 displacement reaction. (01)
 D) Complete the following reactions. Identify A, B and C (03)



E) As written, the following syntheses have flaws. What is wrong with each?

(63)

