

QP Code : 21747

(3 Hours)

N.B.: 1. All questions are compulsory

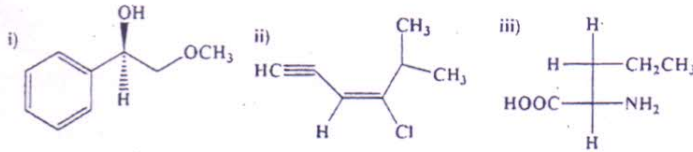
Total Marks: 70

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 nomenclate the following as per IUPAC rules. (Any Two)



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

i) Diethyl 3-methylpentanedioate

ii) 1-Chloro-4-methyl-2-oxopentane

iii) 3,3-Dimethylbutanenitrile

c. Draw possible resonating structures for the following compounds



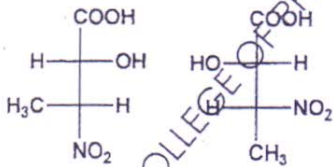
d. Arrange the following in increasing order of basicity and justify.

Aniline, p-nitroaniline

e. Arrange the following in increasing order of acidity and justify.

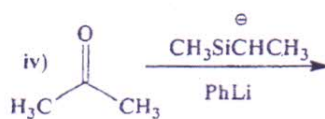
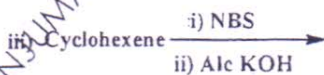
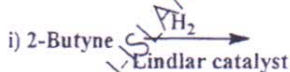
Ethanoic acid, 1-Chloroethanoic acid, 1,1-Dichloroethanoic acid

f. Establish the relationship between following pairs of molecules



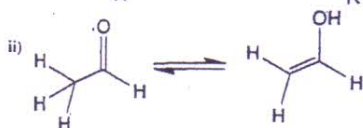
B) Give the products for the following reactions (Any Three)

(03)



[Turn Over]

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



B] i) Classify the following as nucleophile or electrophile. (01)

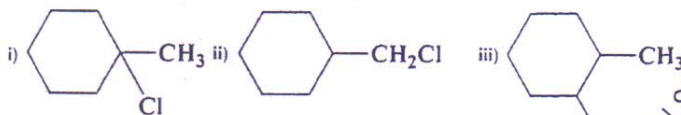


ii) Benzyl carbocation is more stable than aliphatic carbocations. Justify the statement. (01)

C] Neopentyl bromide undergoes nucleophilic substitution reaction to give isopentyl bromide. Give suitable explanation for the following. Suggest a suitable solvent for this reaction. (04)

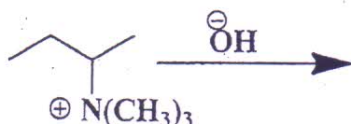
D] What are stereoselective and stereospecific reactions? Explain with one suitable example for each. (No mechanism expected). (03)

Q3) A] List the following alkyl halides in decreasing order of  $\text{S}_{\text{N}}2$  reactivity. Justify your answer.



Propose the mechanism of the most active compound with alcoholic NaOH. (04)

B] Predict the major product of the following reaction. Discuss the mechanism and orientation of the reaction. (04)



i) Represent 2-Methyl-5-nitrohexa-2,4-dienoic acid in its various isomeric forms. (02)

ii) What are enantiomers? Give a suitable example. (01)

Q4) A] Give the product and mechanism of the reaction with nitrobenzene with conc.  $\text{HNO}_3$  and conc.  $\text{H}_2\text{SO}_4$  acid (02)

B] Suggest a suitable method to resolve a racemic mixture of an acidic compound (02)

C] Bring about the following conversions. (04)

i) 1-Butene to 1-cyclopropylethane

ii) 2-Butyne to cis-2-Butene

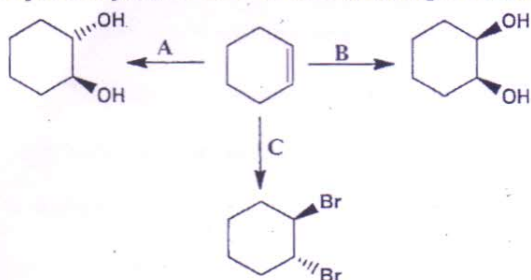
iii) 2-Butyne to trans-2-Butene

iv) Propene to 1-bromopropane

[Turn Over]

D) Identify A, B and C in the following reactions

(03)

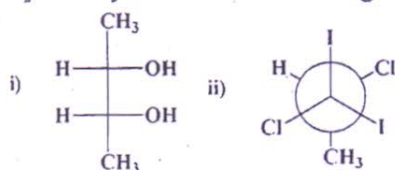


Q5) A) Compare and contrast Erythro and Threo isomers

(02)

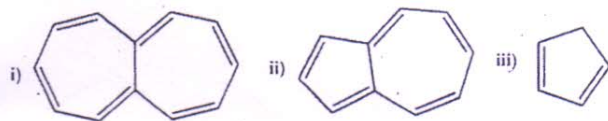
B) Identify whether the following molecules are chiral or achiral. Justify

(02)



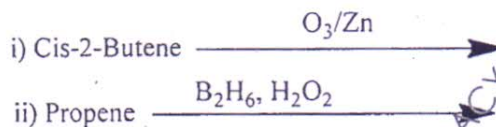
C) State Huckel's rule for aromaticity. Identify whether the given molecules are aromatic, antiaromatic or non-aromatic.

(04)



D) Give the products that would be obtained from the reaction of the following compounds with sodamide in liquid ammonia. i) p-bromotoluene ii) o-bromotoluene iii) 2-Bromo-4-methyltoluene. (03)

Q6) A) Identify the intermediate and give the final product of the following reactions. (04)



B) Attempt the following conversions (Any four):

(04)

- i) Methyl bromide to n-Nonane
- ii) 1-Methylcyclohexene to 1-Methylcyclohexanol
- iii) 1,3-Butadiene to 3-Bromo-1-butene
- iv) Phenol to p-hydroxyacetophenone
- v) Ethyne to 1-Butyne

C) Write a note on chlorination of alkane.

(03)