

QP Code : 24929

(3 Hours)

N.B.: 1. All questions are compulsory

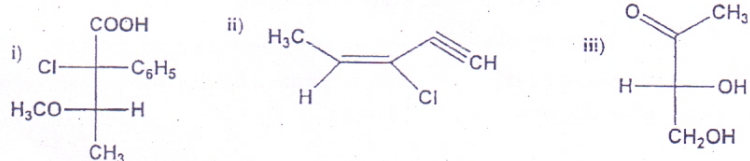
Total Marks: 70

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) Ethyl 5-cyano-3,4-dioxohexanoate

ii) 4-Amino-3-nitrobenzaldehyde

iii) Cyclohexa-1,4-diene-1-carboxamide

c. Draw possible resonating structures for the following compounds

i) Nitrobenzene

ii) Phenol

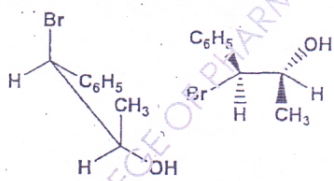
d. Arrange the following in increasing order of basicity and justify.

Ethylamine, Diethylamine, Triethylamine

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

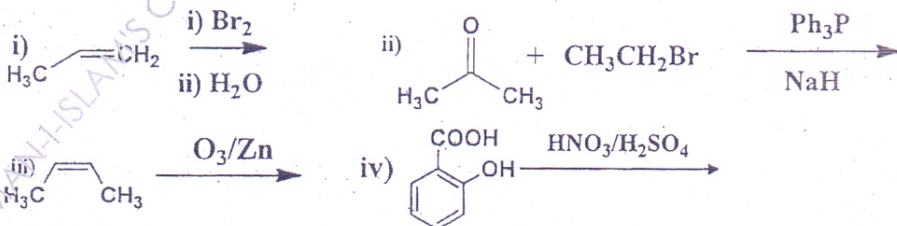
Benzoic acid, p-hydroxybenzoic acid, p-nitrobenzoic acid

f. Establish the relationship between following pair of molecules:



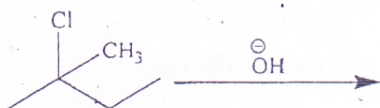
B] Give the products for the following reactions (Any Three)

(03)

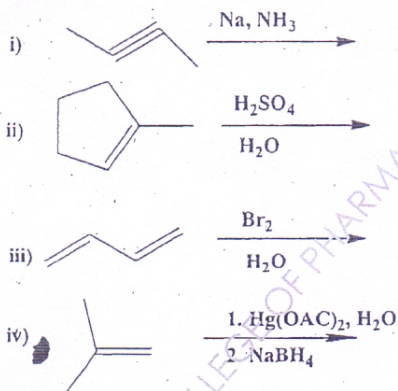


[Turn Over]

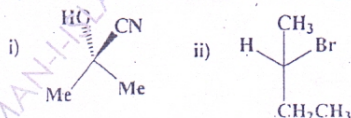
- Q2) A] Explain the concept of "Tautomerism" with one suitable example. (02)
- B] i) Give two examples of electrophiles. (01)
- ii) Give the order of stability of carbanions and justify. (01)
- C] S<sub>N</sub>2 reaction proceeds with complete stereochemical inversion. Justify the statement with suitable example. (04)
- D] Explain the stereochemistry of hydroxylation of cis and trans-2-butene with KMnO<sub>4</sub>. (03)
- Q3) A] Solvolysis of t-butyl chloride is carried out in 2, 2, 2-Trifluoroethanol. Predict the product formed and propose the mechanism of the reaction. (04)
- B] Give all the possible 1, 2-elimination products for the given substrate. Discuss the mechanism of elimination and give two relevant evidences in support of the same. (04)



- C] i) Suggest a suitable method for resolution of a racemic mixture of a base. (02)
- ii) Comment on the optical activity of atropisomers. (01)
- Q4) A]. Which of the following compounds reacts most slowly during Electrophilic aromatic substitution? Justify your answer by giving suitable reasons. (02)
- i) Benzene, ii) Phenol, iii) Acetanilide and iv) Toluene. (02)
- B] Give the complete mechanism using proper curved arrow notation of sulphonation reaction of phenol. (02)
- C] Write a note on hydrobromination of propene in presence and absence of hydrogen peroxide. (04)
- D] Give the product for the following reaction (Any Three) (03)

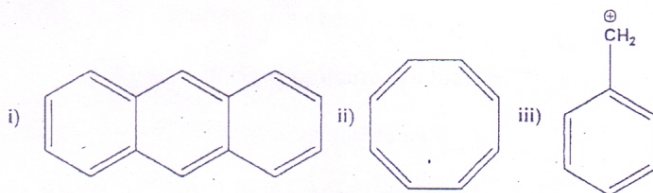


- Q5) A] a) Compare and contrast diastereomers and enantiomers. (02)
- b) Identify whether the following molecules are chiral or achiral. Justify. (02)

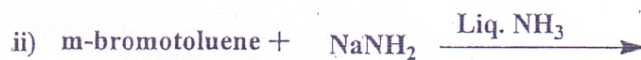
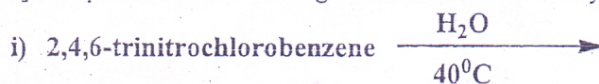


[Turn Over]

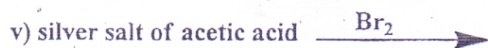
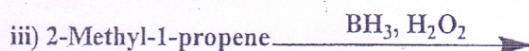
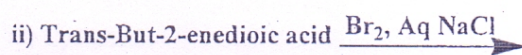
B] State Huckel's rule for aromaticity. Identify whether the given molecules are aromatic, antiaromatic or non-aromatic. (04)



C] Complete the reaction and give the mechanism for any one of the following reaction. (03)



Q6)A] Give the product of the following reactions (Any Four): (04)



B] Attempt the following conversions (Any Four): (04)

i) Propyne to 2-Bromo-2-iodopropane

ii) Cyclohexene to 1,3-Cyclohexadiene

iii) Isobutylene to 2,2,4-Trimethylpentane

iv) Ethyne to acetaldehyde

v) 2-Chlorobutane to 3-Methyloctane

C] Write a brief account on halogenation of alkanes. (03)