

[Time: Three Hours]

[Marks:80]

Please check whether you have got the right question paper.

- N.B: 1. All Question are compulsory.
2. Figures to right indicate full marks

Q.1 A) Answer the Following questions

a) Give suitable structures for the following compounds (any two)

i) 3- oxopentanoic acid

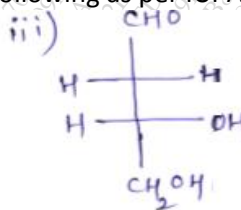
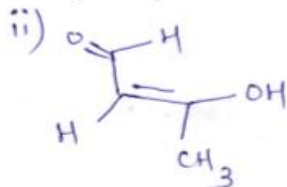
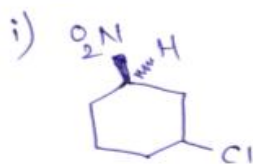
2 M

ii) 4- hydroxymethoxybenzene

iii) 3-bromobutane-1-amine

b) Assign R/S ,E/Z or D/L Notation and Write nomenclature of following as per IUPAC rule (any two)

2 M

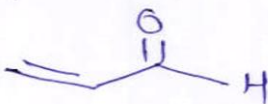


c) Draw possible resonating structure for following compounds

2 M

i) Bromobenzene

ii)



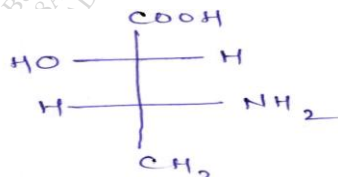
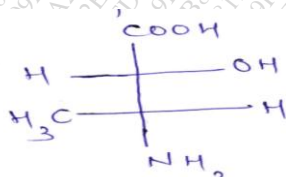
d) Arrange the following in increasing order of acidity and justify

2 M

3 – chloropropionic acid, 2,2 – dichloropropionic acid, 2-chloropropionic acid

e) Establish relationship between following pair of the molecule

2 M

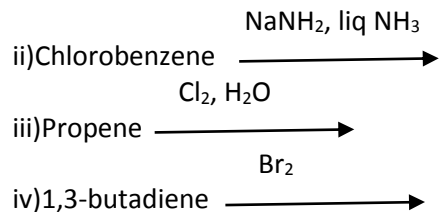
f) Arrange the following in the increasing order of basicity and justify
Aniline, p-nitroaniline, methylamine

2 M

B) Give the product for the following reaction (any three)

3 M





Q2) A) Give different types of tautomers with example. 2 M

B) Arrange the following carbanion in the increasing order of stability and justify. 1 M

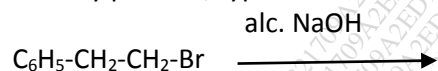


C) Write any two example of nucleophiles. 1 M

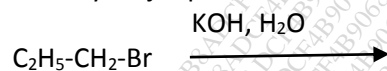
D) Give structure of product expected when 1-methylcyclopentene is treated with the following reagents 3 M

- $\text{Br}_2, \text{H}_2\text{O}$
- $\text{H}_2\text{SO}_4, \text{H}_2\text{O}$
- NBS

E) Identify product, type of reaction and give mechanism for the following reaction 4 M



Q3) A) Identify major product for the following reaction 4 M



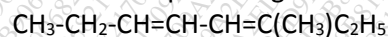
Discuss effect of the following factors on the above reaction

i) reactivity of alkyl halide, ii) nucleophile, iii) Solvent

B) Explain following terms with the suitable example (any three) 3 M

i) Racemic mixture, ii) Enantiomers, iii) Meso compounds, iv) Atropisomerism

C) Write all the possible geometric isomers of the following compound 2 M



D) Suggest suitable method for resolution of basic racemic mixture 2 M

Q4) A) Discuss orientation and reactivity of NH_2 substituent towards electrophilic aromatic substitution reaction 2 M

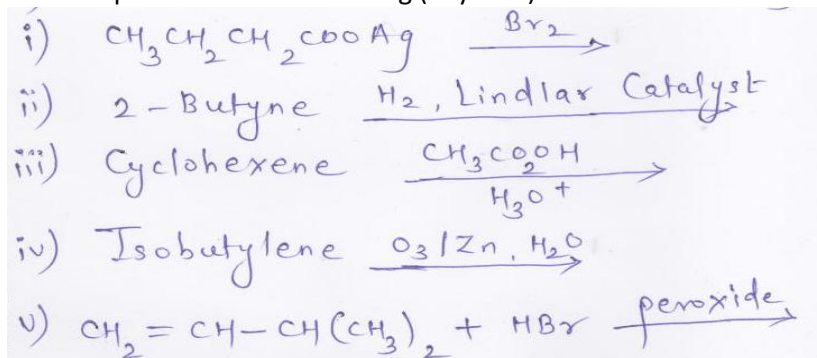
B) Explain mechanism involved in the nitration of benzene 2 M

C) Convert the following (any three) 3 M

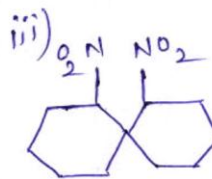
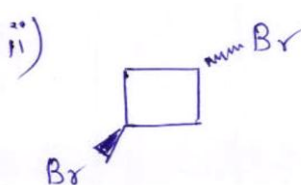
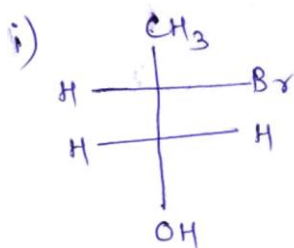
- 1-butene to 1-cyclopropylethane
- Propene to propyne
- Phenol to p-hydroxyacetophenone

iv) 3-bromo-2-methylbutane to 2-methyl-2-butene

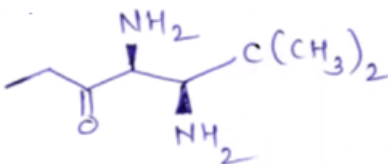
D) Give the product for the following (any four) 4M



Q5) A) Identify the following molecules are chiral or achiral. Justify 3 M



B) Identify assymmetric center in the following molecules 1 M



C) State Huckel Rule for the aromaticity. Identify if the following molecules are aromatic, antiaromatic or non-aromatic 4M

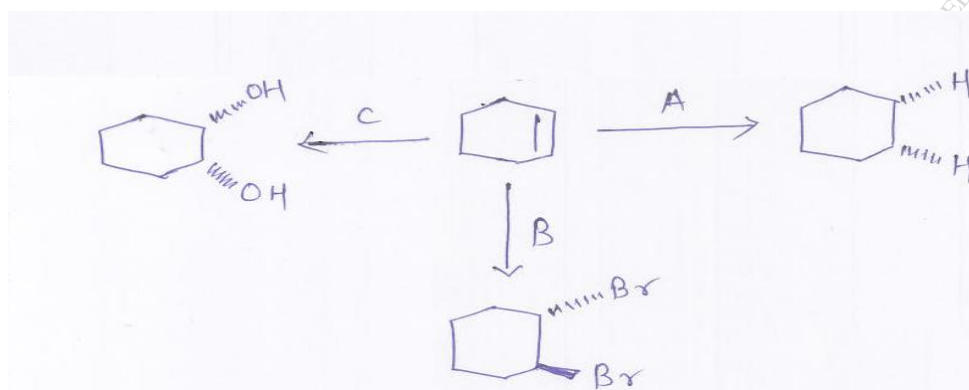


D) Explain elimination-addition mechanism for aromatic nucleophilic substitution reaction 3 M

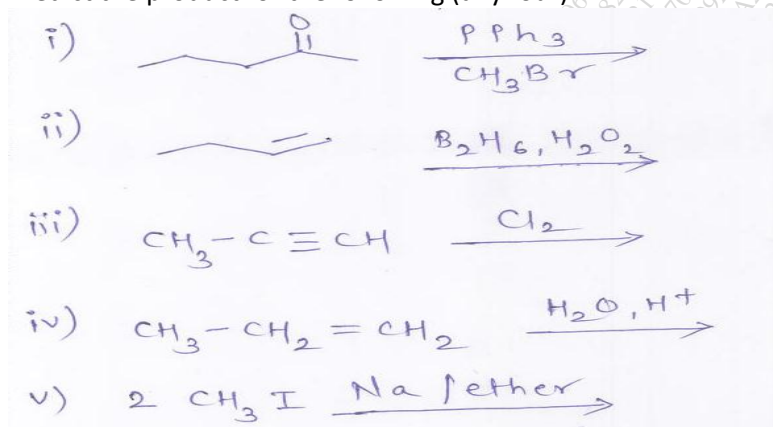
Q6) A) Explain orientation of product formation when 1-propene reacts with Br₂ 2 M

B) Define and discuss with example concept of stereospecific and stereoselective reaction 2M

C) Identify following reagents 3 M



D) Predict the product for the following (any four)



4 M