

[Time: Three Hours]

[Marks:70]

Please check whether you have got the right question paper.

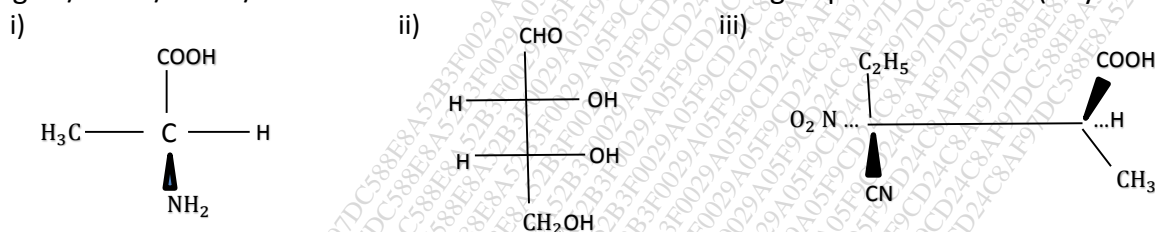
- N.B:
- All the questions are compulsory.
 - Figures to right indicate full marks.

Q.1. A) Answer the following questions:-

a) Give the suitable structure for the following compounds (Any two)

- N-Ethyl-N-Methyl-4-bromoaniline
- S,S-2-bromo-3-hydroxybutane
- 4-ethylbenzenesulfonic acid.

b) Assign E/Z or R/S or D/L notation and nomenclate the following as per IUPAC rules (Any two)



c) Draw possible resonating structures for the following compounds

- Benzaldehyde
- Bromobenzene

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

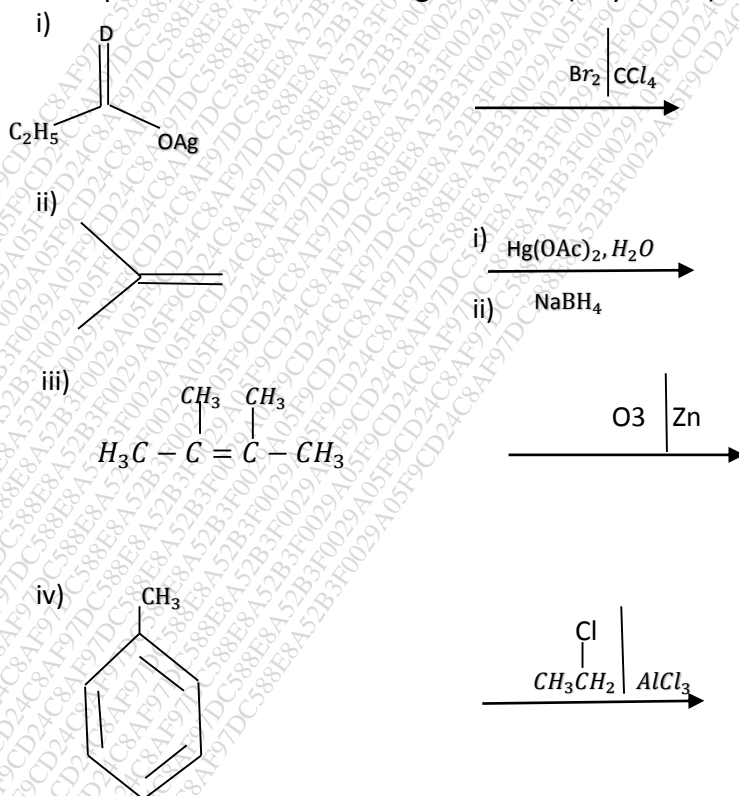
Phenol, p-chlorophenol, p-methoxyphenol.

e) Draw optically active stereoisomeric pair of 2,3-dihydroxy butane

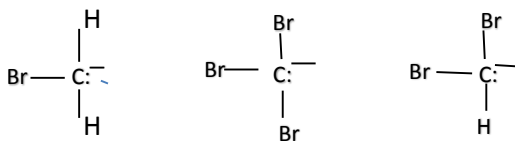
f) Arrange the following in increasing order of basicity and justify?

Aniline, p-toluidine, o-nitroaniline

B) Give the product for the following reactions. (Any Three)

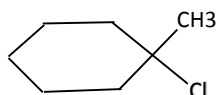


- Q.2. A) Represent 2(S), 3(R)-3-Chloro-2-butanol using various projection formulae. 02
 B) Arrange following carbanions in increasing order of stability and justify the same. 02

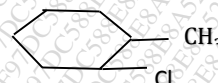


- C) What do you mean by tautomers? Enlist different types of tautomers with examples. 02
 D) List the following alkyl halides in increasing order of SN2 reactivity. Justify your answer. 02

i)



ii)



- E) Enlist different methods for resolution of racemic mixture and explain any one. 02

- Q.3. A) Compare E₁ and E₂ reaction of alkylhalide. 04
 B) Explain the following terms with suitable examples. 03

- i) Stereoselectivity
 ii) Stereospecificity
 iii) Mesoisomers

- C) Explain how the stereochemistry of S_N1 and S_N2 reaction differs. 04

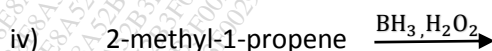
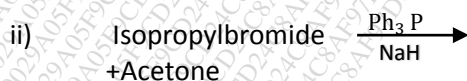
- Q.4. A) Arrange the following compounds in increasing order of reactivity towards electrophilic aromatic substitution reaction and justify your answer by giving suitable reasons. 02
 Toluene, Acetophenone, benzene, phenol.

- B) Discuss orientation and stability of product formation in the nitration reaction of benzoic acid. 02

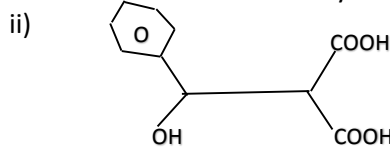
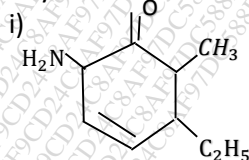
- C) Attempt the following conversions (Any four) 04

- i) Toluene to m-nitrobenzoic acid
 ii) 1-Butene to 2-Butene
 iii) Acetylene to 1-pentyne
 iv) Propene to 1,5-hexadiene
 v) o-bromoanisole to m-anisidine

- D) Give the product for following reactions. (Any Three) 03



- Q.5. A) Identify whether the following molecules are chiral or achiral. Mark asymmetric carbon. 02

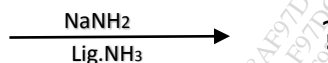
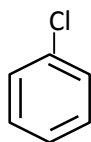


B) Compare and contrast diastereomers and enantiomers. 02

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



D) 03



Identify the product formed when chlorobenzene is treated with sodamide in liquid ammonia and write the mechanism of the reaction.

Q.6. A) Write any two methods for preparation of alkenes 02

B) Compare the stabilities of 1,4-pentadiene and 1,3-pentadiene. 02

C) Attempt the following conversions. (Any Three) 03

i) 1-chlorocyclohexane to 3-bromocyclohexene

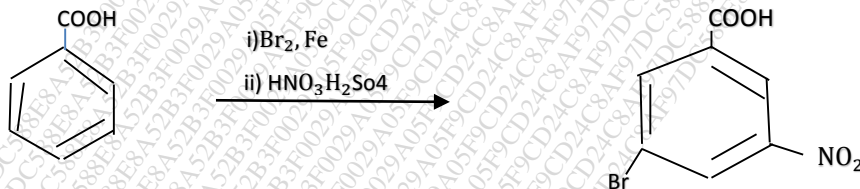
ii) 2-butyne to Z-2-butene

iii) Propene to propylene glycol

iv) Cyclohexene to 1,3-cyclohexadiene.

D) Explain the orientation of chlorination reaction of alkane. 02

E)



Identify flow in the above synthesis Justify your answer.