**Q.P. Code : 03078**

**[Time: 3 Hours]** **[Marks:70]**

Please check whether you have got the right question paper.

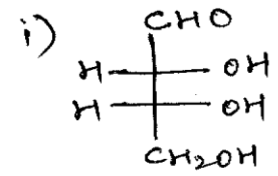
N.B: 1. All questions are compulsory.
2. Figures to the right indicate full marks.

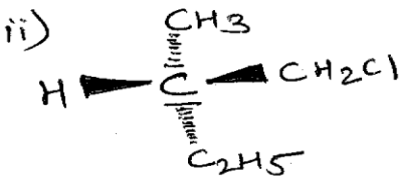
Q.1 A) Answer the following questions:- (12)

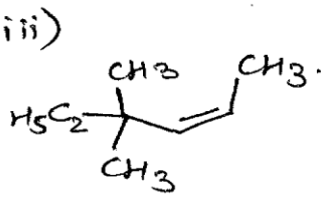
a) Give the suitable structures for the following compounds (Any two) (02)

i. N-Ethyl-N-Methylaniline.
ii. m-methylbenzylalcohol.
iii. 2-Methyl-3-phenylpropenoic acid

b) Assign E/Z or R/S or D/L notation and nomenclate the following as per IUPAC rules (Any two) (02)

i) 

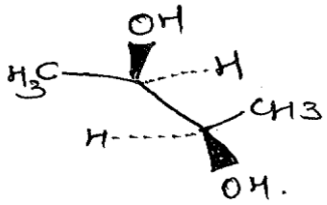

ii) 

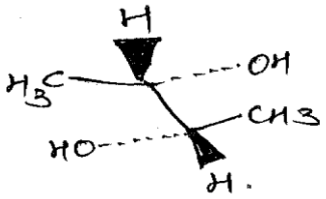

iii) 


c) Draw possible resonating structures for the following compounds. (02)
i) Phenol ii) Benzoic acid

d) Arrange the following in increasing order of acidity and Justify? (02)
p-nitrobenzoic acid, o-nitrobenzoic acid, m-nitrobenzoic acid.

e) Establish the relationship between following pair of Molecules. (02)

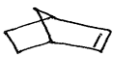



f) Arrange the following in increasing order of basicity and justify? (02)
Ammonia, Methylamine, Aniline.

B) Give the product for the following reactions.(Any three) (03)

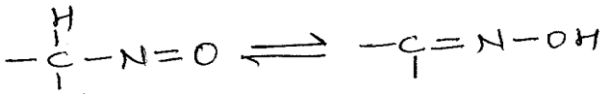
i) $CH_3CH_2CHClCH_3 \xrightarrow{KOH\ (alc.)}$

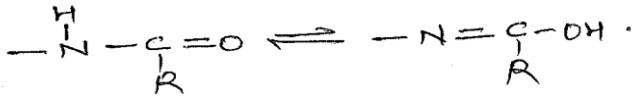
ii)  $\xrightarrow[2)\ NaBH_4.]{1)\ Hg(OAc)_2}$

iii) $CH_3-C\equiv C-CH_3 \xrightarrow{Ag^+}$

iv) $CH_3\text{-}C(CH_3)=CH_2 \xrightarrow{O_3/Zn}$

Q.2 A) Identify tautomeric system present in the following pair Molecules. (02)

i) 

ii) 

B) Arrange the following Carbocations in increasing order of stablitiy and justify. (02)

C) i) Identify electophiles/nucleophiles from the following:- (02)

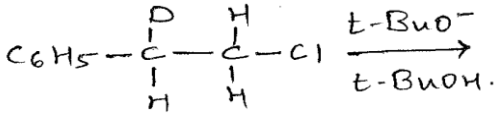
$H^+$, $R_3C^+$, $Cl^-$, $^-OH$, $NH_3$, $AlCl_3$, $BF_3$, $CN^-$

ii) Which type of stereochemistry exist in substituted biphenyl compounds. (02)

D) Discuss stereochemistry for Hydroboration Oxidation reaction of alkenes by taking examples. (03)

Q.3 A) Give the major product of the following reaction and write the reaction mechanism (eg.$E_1$ and $E_2$) through which reaction proceeds. (04)

i) 

ii) 

B) Explain the following term with suitable example. (03)

i. Point of symmetry
ii. Conformation
iii. Dihedral angle

C) Explain stereochemistry involved in $S_N2$ reaction. (04)

Q.4 A) Discuss the orientation and reactivity of nitro group towards electrophilic aromatic substitution reaction. (02)

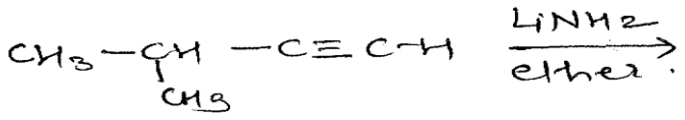
B) Give complete reaction mechanism for Halogenation of alkanes. (02)

C) Attempt the following Conversions (Any Four) (04)

i. Propene to Isopropylalcohol.
ii. Acetylene to Acetaldehyde.
iii. Toluene to 2-bromo-4-nitrotoluene.
iv. Propene to propane.
v. n-chloroethane to n-Butane

D) Give the product for the following reactions.(Any three)

i)



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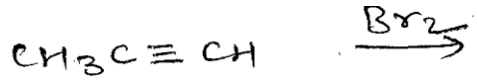

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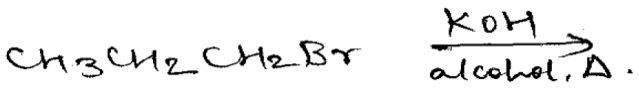
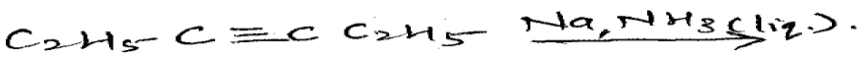
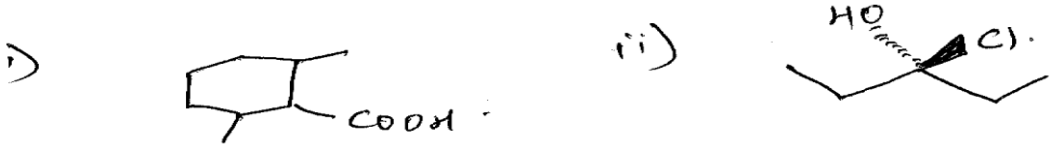


iv)

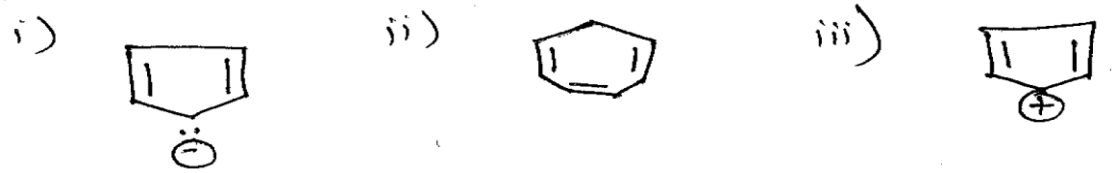


Q.5 A) Identify and mark the stereogenic centers in the compound given below and comment on chirality:- (02)



B) Enlist different methods used for resolution of racemic mixture and explain the resolution of racemic mixture of acidic Compounds. (02)

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



D) Give bimolecular displacement mechanism for nucleophilic aromatic substitution reaction by giving suitable example. (03)

Q.6 A) Write Any two methods for preparation of alkyl halide. (02)

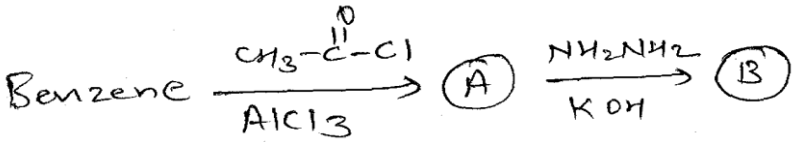
B) Write the structure of the products from hydroboration bromination of Z-2-butene and E-2-butene.

C) Attempt the following conversions.(Any 3) (03)

i. Isobutylene to 2,2,4-Trimethylpentane.
ii. 1-Propene to Propyne.
iii. Isobutylene to Acetone.
iv. 2,3-dibromobutane to 2-butene.

D) Explain 1,4 and 1,2-addition of $Br_2$ to conjugated diene by giving suitable example. (02)

E) Complete the following reaction and Identify A and B . (02)



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