

[Time: 3 Hours]

[Marks: 70]

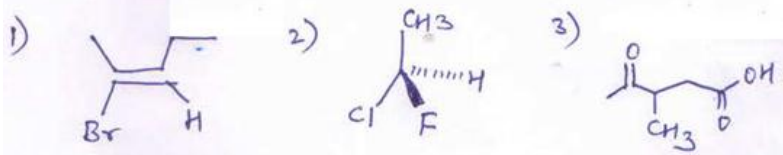
Please check whether you have got the right question paper.

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

Q.1 A) Answer the following questions.

12

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

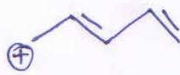


- b. Give suitable structure for following compounds. (Any two)

- 1) methyl propanoate
- 2) 3-nitrocyclopentene
- 3) 4-nitrobenzene sulphonic acid

- c. Draw possible resonating structures for the following compounds

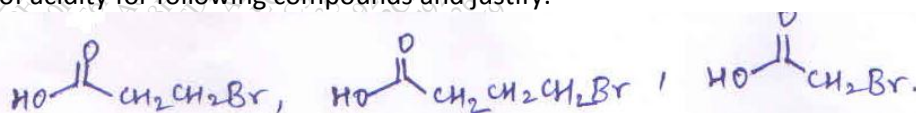
1)



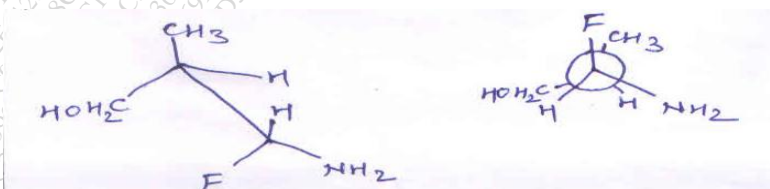
2) Chlorobenzene

- d. Rank the order of basicity for following organic compounds and justify.
Methylamine, Ammonia, Trimethylamine

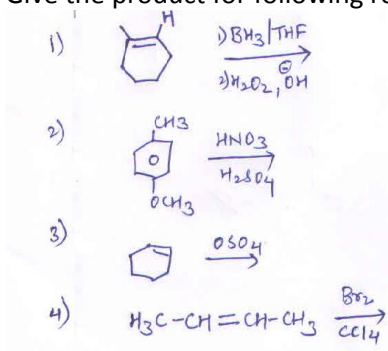
- e. Rank the order of acidity for following compounds and justify.



- f. Establish the relationship between following pair of molecules.



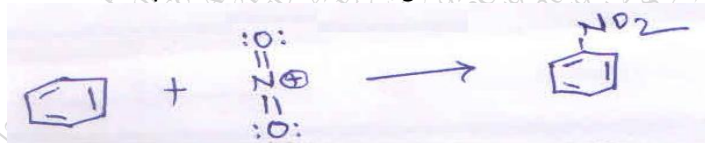
B) Give the product for following reactions. (Any three) 03



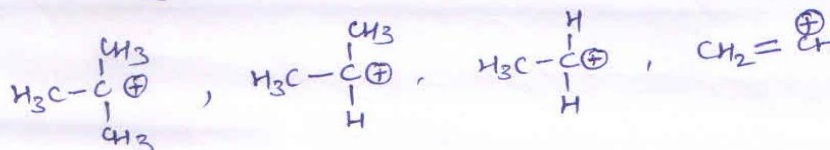
Q.2 A) Identify tautomeric system existing in following pair of molecules. 1



B) Identify the nucleophiles and electrophiles in the following reaction. 1

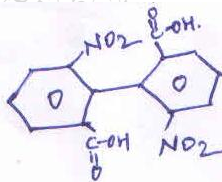


C) 1) Arrange the following sets of carbocation in increasing order of stability and justify. 2



2) Explain the stereochemistry of addition of halogen to alkene. 2

3) Predict whether the following compound is chiral or achiral. Justify. 2



D) Complete the following table. 3

		Types of solvent	Example of nucleophile	Stereochemistry
i)	$\text{S}_{\text{N}}1$			
ii)	$\text{S}_{\text{N}}2$			

Q.3 A) What are enantiomers, give suitable example. 1

B) Represent 2(S), 3(S) -2, 4-dihydroxy-3-nitrobutanoic acid using various projection formulae. 2

C) Predict Saytzeff's product for dehydrohalogenation reaction of 2-bromobutane using alcoholic KOH. Give mechanism of its formation. 4

D) Compare and contrast factors affecting E_1 and E_2 reaction. 4

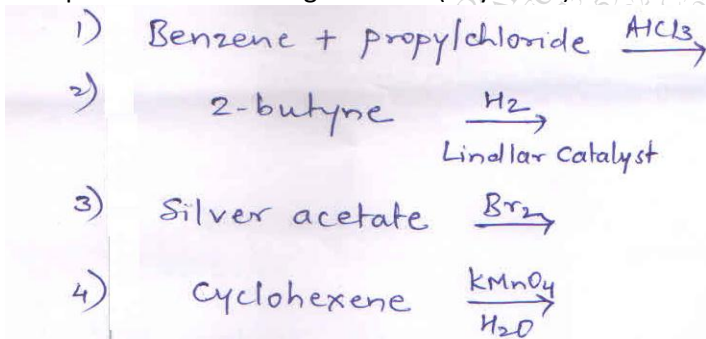
Q.4 A) Discuss the orientation and reactivity of chloro group towards electrophilic aromatic substitution. 2

B) Give complete reaction mechanism for Friedel Craft's acylation reaction. 2

C) Give the probable structure for following : (Any four) 4

- 1) A product obtained on addition of HBr to 2-methyl-but-2-ene
- 2) Identify alkene yielding formaldehyde and propanaldehyde on ozonolysis.
- 3) An alkene obtained on dehydration of 2-methyl-2-butanol.
- 4) A product obtained on reacting acetone with phosphorous ylides.
- 5) A product obtained on reacting propene with methylene iodide in presence of zinc/copper.

D) Give product for following reaction. (Any three) 3

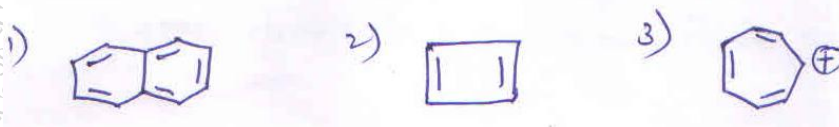


Q.5 A) Explain the following terms. 2

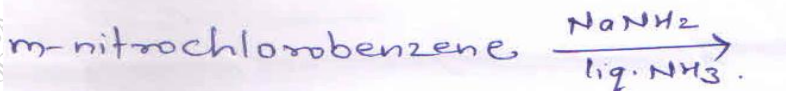
- i) Plane of symmetry
- ii) Mesomer

B) Explain the different methods used for resolution of racemic mixture 2

C) State the Huckel's rules for aromaticity. Identify whether the given molecules are aromatic, anti-aromatic or non-aromatic. 4



D) Identify product, type of reaction and mechanism for following reaction: 3



Q.6 A) Write any two methods for preparation of alkynes. 2

B) What is stereospecific reaction? 1

- C) Attempt the following conversion. (Any three) 3
- 1) 3-hexyne to 3-hexene
 - 2) 2-butyne to 2,3-dichlorobutene
 - 3) 1-propene to 1-propyne
 - 4) 1-pentene to pentane-2-ol
- D) Explain 1,4 and 1,2- addition of Br_2 to conjugate diene by giving suitable example. 2
- E) Complete the following reaction and identify A, B and C. 3
