

Class 12 - Chemistry

organic 12

Maximum Marks: 100

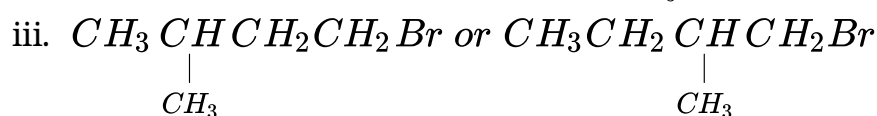
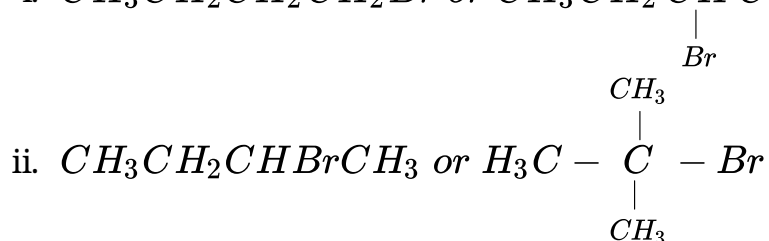
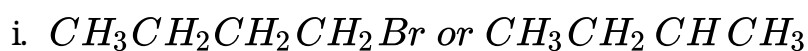
Time Allowed: 2 hours

General Instructions:

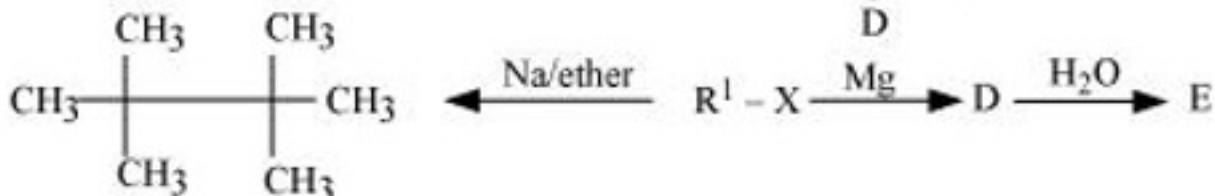
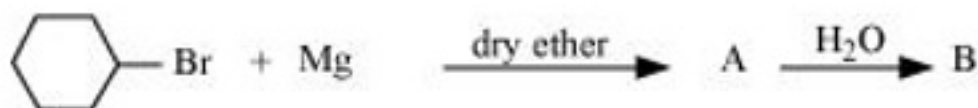
ANSWER ALL QUESTIONS

Section A

1. Which alkyl halide from the following pairs would you expect to react more rapidly by an S_N2 mechanism? Explain your answer. 4



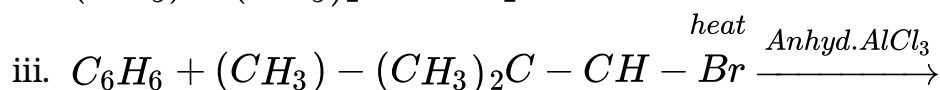
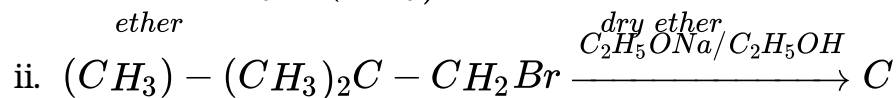
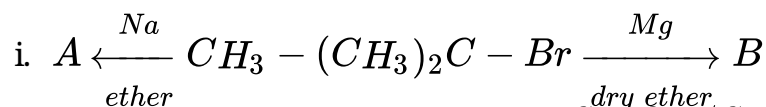
2. Identify A, B, C, D, E, R and R^1 in the following: 4



3. Does the presence of two chiral carbon atoms always make the molecule optically active? Explain giving an example. 2
4. What are haloarenes? How are they classified? Give one method for each of the preparation of nuclear and side chain substituted haloarenes. 2
5. CH_3Br react with KCN to form CH_3CN as main product while $AgCN$ forms CH_3NC as 2

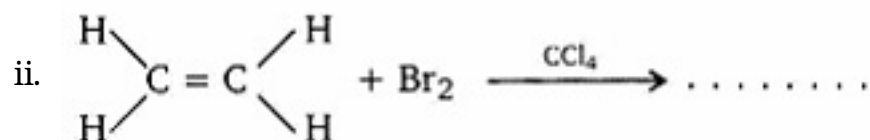
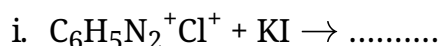
the chief product. Explain.

6. Complete the following giving the structures of major organic products. 2



7. The treatment of alkyl chlorides with aq. KOH leads to the formation of alcohols but in the presence of alcoholic KOH, alkenes are major products. Explain. 2

8. Complete the following reaction equation: 5



9. Explain ambident nucleophiles with the help of examples. 5

10. Arrange the following in increasing order of C-X bond length where X=halogen: 5
 $CH_3F, CH_3Br, CH_3Cl, CH_3I$

11. Write balanced equation for the following: 5

i. When chloroform is oxidized by air

ii. Chloroform reacts with chlorine.

12. Write the structure of the major organic product in each of the: 5
 $CH_3 - CH_2 - CH_2Cl + NaI$ (in acetone)

13. Ortho and para nitrophenols are more acidic than phenol. Draw the resonance structures of the corresponding phenoxide ions. 5

14. Write equations of the following reactions: 5

i. Friedel-Crafts reaction-alkylation of anisole.

ii. Nitration of anisole.

iii. Bromination of anisole in ethanoic acid medium.

iv. Friedel-Craft's acetylation of anisole.

15. Write the reaction and the conditions involved in the conversion of: 2

a. Propane to 1-propanol

b. Phenol to salicylic acid

16. Give two reactions that show the acidic nature of phenol. Compare acidity of 2

16. Give two reactions that show the acidic nature of phenol. Compare acidity of phenol with that of ethanol. 2
17. How are the following conversions carried out 2
- 1-propanol to 1-chloro-2-propanol.
 - Phenol to salicylic acid.
18. Name the reagents used in the following reactions: 2
- Oxidation of a primary alcohol to carboxylic acid.
 - Oxidation of a primary alcohol to an aldehyde.
 - Bromination of phenol to 2, 4, 6-tribromophenol.
19. A compound 'A' with molecular formula $C_4H_{10}O$ on oxidation forms compound 'B' gives positive iodoform test and on reaction with CH_3MgBr followed by hydrolysis gives (c). Identify A, B & C. 2
20. An aromatic compound (A) having molecular formula C_6H_6O on treatment with $CHCl_3$ and KOH gives a mixture two isomers 'B' and 'C' both of 'B' & 'C' give same product 'D' when distilled with Zn dust. Oxidation of 'D' gives 'E' of formula $C_7H_6O_2$. The sodium salt of 'E' on heating with soda lime gives 'F' which may also be obtained by distilling 'A' with zinc dust. Identify compounds 'A' to 'F' giving sequence of reactions.? 2
21. Write structures of the compounds whose IUPAC names are as follows: 2
- 2, 3 - diethylphenol
 - 1-Ethoxypropane
 - 2-Ethoxy-3-methylpentane
22. An organic compound (X) when dissolved in ether and treated with magnesium metal forms a compound Y. The compound, Y, on treatment with acetaldehyde and the product on acid hydrolysis gives isopropyl alcohol. Identify the compound X. What is the general name of the compounds of the type Y. 2
23. Draw the structure and name the product formed if the following alcohols are oxidized. Assume that an excess of oxidizing agent is used. 2
- $CH_3CH_2CH_2CH_2OH$
 - 2-Butanol
 - 2-methylpropanol
24. Show how will you synthesize: 2

- i. 1-phenylethanol from a suitable alkene
- ii. Cyclohexylmethanol using an alkyl halide by an S_N2 reaction
- iii. Pentane-1-ol using a suitable alkyl halide.
25. An organic compound (A) (molecular formula $C_8H_{16}O_2$) was hydrolysed with dilute sulphuric acid to give a carboxylic acid (B) and an alcohol (C). Oxidation of (C) with chromic acid produced (B). (C) on dehydration gives but-1-ene. Write equations for the reactions involved. **3**
26. What is meant by the Cyanohydrin? Give an example. **3**
27. Name the following compounds according to IUPAC system of nomenclature: **3**
1. $CH_3CH(CH_3)CH_2CH_2CHO$
 2. $CH_3CH = CHCHO$
 3. $(CH_3)_3CCH_2COOH$
 4. $OHCC_6H_4CHO - p$
28. What is meant by Semicarbazone? Give an example. **3**
29. How will you convert ethanal into the following compounds? **3**
- i. Butan-2-one
 - ii. Butan-1-ol
 - iii. Butanoic acid
30. Why $HCOOH$ does not give Hell-Volhard-Zelinsky (HVZ) reaction but CH_3COOH does? **3**
31. What Grignard reagent would use to make the following conversions? **3**
1. Acetophenone to 2-phenyl-2-butanol
 2. Formaldehyde to benzyl alcohol.
32. Would you expect benzaldehyde to be more reactive or less reactive in nucleophilic addition reactions than propanal? Explain. **3**
33. Give chemical tests to distinguish between the following pairs of compounds. **3**
- a. Phenol and Benzoic acid.
 - b. Benzaldehyde and Acetophenone.