

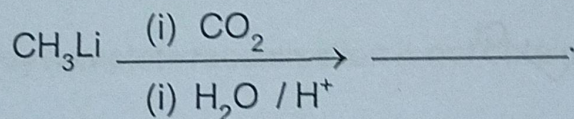
2023**Time - 3 hours****Full Marks - 60***Answer all groups as per instructions.**Figures in the right hand margin indicate marks.***GROUP - A**

1. Fill in the blanks. (all)

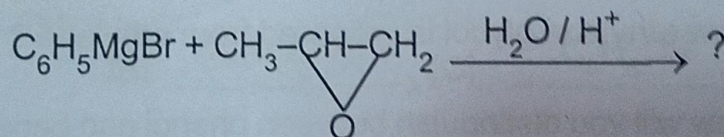
[1 × 8]

(a) $\text{RCl} + \text{KI} \rightarrow \text{RI} + \text{KCl}$. This reaction is called _____.

(b) Write the product :

(c) Tert-butyl-alcohol on heating with conc. H_2SO_4 at 300 K yield _____.

(d) Write the product :



(e) Formalin is an aqueous solution of _____.

(f) Benzaldehyde when refluxed with aqueous / alcoholic KCN forms _____.

P.T.O.

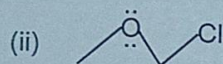
[2]

- (g) Formic acid can be distinguished from acetic acid by _____.
- (h) A small quantity of _____ is added in LPG cylinders to detect leakage.

GROUP – B

2. Answer any eight of the following questions within two to three sentences each. [1½ × 8]

(a) Compare the rate of SN¹ reaction among the followings :



- (b) How will you convert chlorobenzene to p-chloro toluene ?
- (c) What happens when organo lithium compounds react with α, β -unsaturated carbonyl compounds ?
- (d) How ethylene glycol is prepared from ethylene ?
- (e) How will you distinguish between phenol and benzyl alcohol ?
- (f) Why ethyl alcohol has higher boiling point than dimethyl ether ?

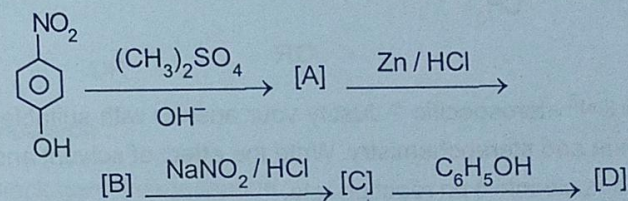
[3]

- (g) Why formaldehyde does not respond aldol-condensation ?
- (h) Why acetaldehyde is more reactive than acetone towards nucleophilic addition reaction ?
- (i) Why aromatic acylchlorides are less reactive than aliphatic acyl chlorides ?
- (j) Why organic acids have high boiling points ?

GROUP – C

3. Answer any eight of the following questions within 75 words each. [2 × 8]

- (a) Why vinyl halides and aryl halides are unreactive towards nucleophilic substitution ?
- (b) Why complete racemisation is not obtained in SN¹ reaction ?
- (c) Complete the following sequence :



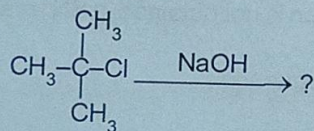
- (d) Describe Zeisel's method for estimation of alkyl groups in ethers.
- (e) Give a brief account of oxidative cleavage of periodic acid.

[4]

- (f) Write a short note on keto-enol tautomerism.
- (g) What is Reformatsky reaction ? Give its synthetic importance.
- (h) Write the mechanism of Beckmann rearrangement.
- (i) Discuss the relative stability of acyl derivatives.
- (j) What happens when ammonium acetate is heated with glacial acetic acid and the product they formed is reacted (heated) with bromine and caustic potash solution ?

GROUP – D*Answer all questions.*

4. Discuss the mechanism and stereochemistry of the reaction given below. Write the effect of solvent on the rate of this reaction : [6



OR

Is SN^2 stereospecific ? Justify your answer with suitable mechanism and stereochemistry. Write the effect of solvent and attacking nucleophile on reaction rate.

5. Write any one method for the preparation of ethylene glycol. What happens when it reacts with (i) SOCl_2 (ii) Anhydrous ZnCl_2 (iii) $(\text{CH}_3\text{COO})_4\text{Pb}$. [6

[5]

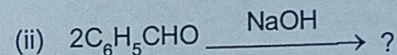
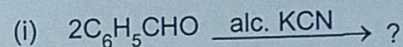
OR

Write brief notes on :

[3 × 2

- (i) Pinacol-Pinacolone rearrangement
- (ii) Reimer-Tiemann reaction

6. Write the product and mechanism of the following reactions : [3 × 2



OR

Describe the synthesis and synthetic applications of malonic ester. [6

7. Discuss the mechanism of acid and base catalysed hydrolysis of ester. [6

OR

Write notes on :

[3 × 2

- (i) Dieckmann condensation
- (ii) Hoffmann bromamide degradation