

(3 Hours)

[Total Marks : 70

N.B. : (1) All questions are compulsory.

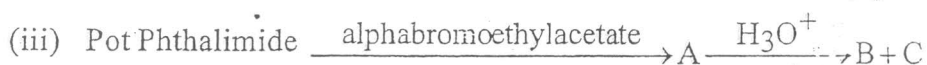
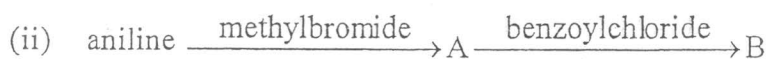
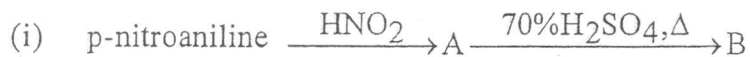
1. (a) Give the identification test for the following : 2
 (i) an amide
 (ii) phenol
- (b) Give reasons for the following : 3
 (i) secondary amines are more basic than primary amines.
 (ii) Imides are more acidic than amides.
 (iii) phenol is a weaker acid than benzoic acid.
- (c) Complete the following reactions by writing the structures of products formed : 5
 (i) 2 moles of benzaldehyde $\xrightarrow{\text{Conc. NaOH}}$
 (ii) 2, 3- diphenyl butane 2,3 - diol $\xrightarrow{\text{H}^+}$
 (iii) 2 moles of benzaldehyde $\xrightarrow{\text{aq-alc. KCN}}$
 (iv) $\text{C}_6\text{H}_5\text{C}(\text{O})\text{CHN}_2 \xrightarrow{\text{Ag}_2\text{O}} \xrightarrow{\text{C}_2\text{H}_5\text{OH}}$
 (v) Oxime of butanone $\xrightarrow{\text{Na} + \text{C}_2\text{H}_5\text{OH}, \Delta}$
- (d) Use suitable reagents and complete the following conversions : 5
 (i) Phenol \rightarrow Salicylaldehyde
 (ii) Naphthalene \rightarrow Naphthalene 2 - sulfonic acid
 (iii) t- butyl bromide \rightarrow 2,2- dimethyl propionic acid
 (iv) Salicylaldehyde \rightarrow Catechol
 (v) Diethylmalonate \rightarrow Propionic acid
2. (a) Complete the following reactions by writing the structure of product formed and the mechanism involved. 4
 (i) $\text{C}_6\text{H}_5\text{C}(\text{O})\text{C}(\text{O})\text{C}_6\text{H}_5 \xrightarrow[\Delta]{\text{alc. KOH}}$
 (ii) p-nitrobenzamide $\xrightarrow{\text{NaOBr}}$
- (b) Write the following conversions (Any TWO) 4
 (i) Ethylacetate to ethylacetoacetate
 (ii) p-nitrobenzaldehyde to p-nitrobenzamide
 (iii) Acetophenone to benzoic acid
- (c) Explain electrophilic substitution on phenol with respect to activation of ring and orientation. Cite examples of nitration and bromination. 3

[TURN OVER

3. (a) Answer the following :

- (i) Discuss the migratory aptitude of substituted benzamides during Hofmann degradation.
- (ii) Discuss the reaction of phenyldiazonium chloride with :
- (a) alpha naphthol
- (b) dimethylaniline

(b) Write the products involved in each step and explain (Any TWO)



(c) (i) Give two methods of synthesis of alcohols.

(ii) Explain the reaction of ROH with HX and account for the order of reactivity of HX : HI > HBr > HCl > HF

4. (a) Answer the following :

(i) Draw the important conformers of n-butane and mention their relative stability.

(ii) Draw neatly the cis and trans conformers of cyclohexane 1, 2 - diol and briefly discuss their stability and optical activity.

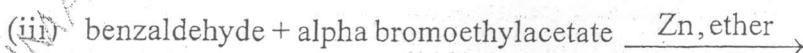
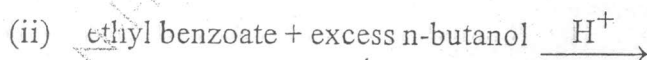
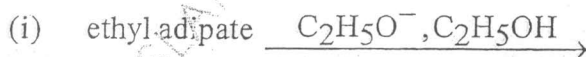
(b) Write the structure of products formed in each step of the following reactions :



(ii) alpha tetralone



(c) Complete the following reactions :



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5. (a) Answer the following conversions and briefly discuss the mechanism involved. 4
- p-nitrobenzaldehyde to p-nitrocinnamic acid.
 - trimethyl benzylammonium chloride to orthomethyl dimethyl benzylamine.
- (b) Give a method of synthesis of anisole and also discuss the reaction of ethers with HI. 3
- (c) Write the structure of products formed 3
- When Naphthalene is reacted with
 - $\text{Na} + \text{C}_2\text{H}_5\text{OH}$
 - $\text{O}_2, \text{V}_2\text{O}_5, \Delta$
 - $\text{H}_2, \text{Ni}, 200^\circ\text{C}$
 - Write the products formed when betanaphthol is treated with Raneynickel. 1
6. (a) Write the mechanism of the following reactions including the alternate mechanism proposed. Use suitable examples to explain. 4
- Alkaline hydrolysis of an ester
 - Favorskii rearrangement
- (b) Complete the following reactions by writing the structure of the products formed (Any FOUR) 4
- diethyloxalate + ethylphenylacetate $\xrightarrow{\text{C}_2\text{H}_5\text{O}^-, \text{C}_2\text{H}_5\text{OH}}$
 - Phenylacetic acid $\xrightarrow{\text{PCl}_3}$
 - Propiophenone $\xrightarrow{\text{Zn(Hg), HCl}}$
 - Cyclohexanone $\xrightarrow{\text{Ph}_3\text{P=CH}_2}$
 - acetone + diethylsuccinate $\xrightarrow{t\text{-BuOK}}$
- (c) Write the products formed when acetophenone is reacted with any THREE of the following reagents : 3
- $\text{CF}_3\text{CO}_3\text{H}$
 - $\text{S} + \text{morpholine}; \text{H}_3\text{O}^+$
 - $\text{H}_2\text{NOH}; \text{P}_2\text{O}_5, \Delta$
 - $\text{HCONH}_2; \Delta$