Sem. IV Organic Chem-II March 2015
CBSGS

Q.P. Code : **15842**

(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 bezaldehyde $\xrightarrow{\text{Conc.NaOH}}$
   (ii) 2, 3- diphenyl butane 2,3 - diol $\xrightarrow{H^+}$
   (iii) 2 moles of benzaldehyde $\xrightarrow{\text{aq-alc.KCN}}$
   (iv) $C_6H_5\underset{\underset{O}{\|}}{C}CHN_2 \xrightarrow{Ag_2O} \xrightarrow{C_2H_5OH}$
   (v) Oxime of butanone $\xrightarrow{Na + C_2H_5OH,\ \Delta}$
   (d) Use suitable reagents and complete the following conversions : 5
   (i) Phenol → Salicylaldehyde
   (ii) Naphthalene → Naphthalene 2 - sulfonic acid
   (iii) t- butyl bromide → 2,2- dimethyl propionic acid
   (iv) Salicylaldehyde → Catachol
   (v) Diethylmalonate → Propionic acid

2. (a) Complete the following reactions by writing the structure of product formed and the mechanism involved. 4
   (i) $C_6H_5\underset{\underset{O}{\|}}{C}\underset{\underset{O}{\|}}{C}C_6H_5 \xrightarrow[\Delta]{\text{alc.KOH}}$
   (ii) p-nitrobenzamide $\xrightarrow{NaOBr}$
   (b) Write the following conversions (Any **TWO**) 4
   (i) Ethylacetate to ethylactoacetate
   (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

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3. (a) Answer the following : 4

(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) 4

(i) p-nitroaniline $\xrightarrow{HNO_2}$ A $\xrightarrow{70\%H_2SO_4,\Delta}$ B

(ii) aniline $\xrightarrow{\text{methylbromide}}$ A $\xrightarrow{\text{benzoylchloride}}$ B

(iii) Pot Phthalimide $\xrightarrow{\text{alphabromoethylacetate}}$ A $\xrightarrow{H_3O^+}$ B + C

(c) (i) Give two methods of synthesis of alcohols. 2

(ii) Explain the reaction of ROH with HX and account for the order of reactivity of HX : HI > HBr > HCl > HF 1

4. (a) Answer the following :

(i) Draw the important conformers of n-butane and mention their relative stability. 1

(ii) Draw neatly the cis and trans conformers of cyclohexane 1, 2 - diol and briefly discuss their stability and optical activity. 3

(b) Write the structure of products formed in each step of the following reactions : 4

(i) 1, 4 - naphthaquinone + 1, 3- butadiene $\rightarrow$ A $\xrightarrow{CrO_3}$ B $\xrightarrow{Zn,\Delta}$ C

(ii) alpha tetralone

(a) $\xrightarrow{\text{methylMgbromide}}$ A $\xrightarrow{Pd,\Delta}$ B

(b) H_3O^+

(c) Complete the following reactions : 3

(i) ethyl adipate $\xrightarrow{C_2H_5O^-,C_2H_5OH}$

(ii) ethyl benzoate + excess n-butanol $\xrightarrow{H^+}$

(iii) benzaldehyde + alpha bromoethylacetate $\xrightarrow{Zn,\text{ether}}$

5. (a) Answer the following conversions and briefly discuss the mechanism involved. 4
   (i) p-nitrobenzaldehyde to p-nitrocinnamic acid.
   (ii) 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
   (i) When Naphthalene is reacted with 3
   (a) $Na + C_2H_5OH$
   (b) O_2, V_2O_5, Δ
   (c) H2, Ni, 200°C
   (ii) 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
   (i) Alkaline hydrolysis of an ester
   (ii) Favorskii rearrangement
   (b) Complete the following reactions by writing the structure of the products formed (Any **FOUR**) 4

   (i) diethyloxalate + ethylphenylacetate $\xrightarrow{C_2H_5O^-, C_2H_5OH}$

   (ii) Phenylacetic acid $\xrightarrow{PCl_3}$

   (iii) Propiophenone $\xrightarrow{Zn(Hg), HCl}$

   (iv) Cyclohexanone $\xrightarrow{Ph_3P=CH_2}$

   (v) acetone + diethylsuccinate $\xrightarrow{t\text{-}BuOK}$

   (c) Write the products formed when acctophenone is reacted with any **THREE** of the following reagents : 3
   (i) CF_3CO_3H
   (ii) S + morpholine; H_3O^+
   (iii) H_2NOH; P_2O_5, Δ
   (iv) $HCONH_2$; Δ