

**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034****B.Sc. DEGREE EXAMINATION – CHEMISTRY**

THIRD SEMESTER – NOVEMBER 2007

**CH 3502 - ORGANIC FUNCTIONAL GROUPS - I**

AD 7

Date : 27/10/2007  
Time : 9:00 - 12:00Dept. No. 

Max. : 100 Marks

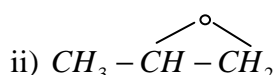
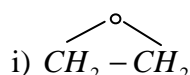
**PART – A****Answer ALL the questions.****(10 x 2 = 20 marks)**

- Give the IUPAC name of the following
  - $CH_2 = CH - CH_2 - Cl$
  - $CH_3 - CH_2 - CH(CH_3) - CH_2 - Cl$
- How will you convert nitro benzene into chloro benzene.
- How will you prepare phenol from cumene.
- Give the products of the following reaction.
  - Cyclo hexanol  $\xrightarrow{CrO_3}$
  - $CH_3 - CH_2 - CH = CH_2 \xrightarrow{(BH_3)_2} \xrightarrow{H_2O_2, OH^-}$
- How will you prepare phenyl methyl ether from phenol using Williamson's synthesis.
- Give the products of the following reaction.
 
$$C_6H_5MgBr + \begin{array}{c} CH_2 - CH_2 \\ \diagdown \quad / \\ O \end{array} \longrightarrow ?$$
- How will you convert acetone into 2-methyl propenoic acid.
- Which type of aldehydes undergo Cannizaro reaction. Give examples.
  - Give the products of the following reaction
 
$$2HCHO \xrightarrow{50\% NaOH}$$
- Arrange the following acids in the order of increasing acid strength and give reasons.
 
$$CH_3CH_2 - CHCl - COOH, \quad Cl - CH_2CH_2 - CH_2 - COOH,$$

$$CH_3 - CHCl - CH_2 - COOH, \quad CH_3 - CH_2 - CH_2 - COOH,$$
- Explain trans esterification reaction with a specific example.

**PART – B****Answer any EIGHT questions.****(8 x 5 = 40 marks)**

- Explain the mechanisms of E2 and E1 reactions of alkyl halides.
- How will you explain the inertness of chlorine in chloro benzene and vinyl chloride in substitution reactions?
- What is Reimer – Tiemann reaction? Explain its mechanism.
- Explain the mechanism of Michael addition reaction.
- Although both phenol and alcohols contain hydroxyl group, phenol is acidic whereas aliphatic alcohols are not acidic – Explain.
- Give the products of the following reaction.
    - $C_2H_5 - O - C_2H_5 + PCl_5 \rightarrow ?$
    - $C_2H_5 - O - C_2H_5 + H_2SO_4 \xrightarrow{\Delta} ?$
    - $C_2H_5 - O - C_2H_5 + HI \rightarrow ?$
  - Give the IUPAC name of



17. What is Perkin's reaction explain its mechanism.
18. Illustrate Norrish type-II reaction with an example.
19. Explain crossed aldol condensation with an example.
20. What is Wittig reaction? Explain its mechanism.
21. Discuss the geometric isomerism of unsaturated dicarboxylic acids.
22. Explain the mechanism of alkaline hydrolysis of esters.

**PART – C**

**Answer any FOUR questions.**

**(4 x 10 = 40 marks)**

23. i) Explain the fact that allyl chloride undergoes substitution reaction by  $S_N1$  mechanism whereas n-propyl chloride reacts by  $S_N2$  mechanism.  
ii) Write in detail about the effect of the following in aliphatic nucleophilic substitution.
  - i. Structure of alkyl halide.
  - ii. Nature of leaving group.
  
24. i) How will you convert phenol into
  - i. Salicylic acid.
  - ii. Ethoxy benzene
  - iii. Phenolphthalein. Write the mechanism involved.ii) Write the mechanisms involved in the following reactions.
  - a) Nitration of phenols.
  - b) Sulphonation of phenols.
  
25. i) How is acetic acid converted to thyl acetoacetate.  
ii) How would you prepare the following compounds from acrylic acid.
  - i. Propionic acid.
  - ii. Glyceric acid.
  - iii.  $\beta$ -bromo propionic acid.
  
26. i) What is the action of heat on
  - i. Lactic acid
  - ii.  $\beta$ -hydroxy butyric acid
  - iii.  $\gamma$ -hydroxy butyric acidii) a) Give any one method of preparation of Crotonic acid.  
b) What is the product obtained when crotonic acid reacts with N-bromo succinimide.
  
27. i) How will you prepare the following compounds
  - i. 2-propanol from  $CH_3CHO$
  - ii. lactic acid from  $CH_3COCH_3$ii) Discuss the mechanism of Reformatsky reaction.
  
28. i) How do ethers react with
  - i. Hot conc. HI
  - ii. Acetyl chloride. Give the products and the mechanism involved.ii) How will you prepare
  - a) Ethylene oxide from ethylene.
  - b) Diethyl ether from ethanol
  - c) 1-propanol from ethylene oxide.