



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – CHEMISTRY

THIRD SEMESTER – NOVEMBER 2016

CH 3506/CH 3502/CH 4500 – ORGANIC FUNCTIONAL GROUPS - I

Date: 04-11-2016

Dept. No.

Max. : 100 Marks

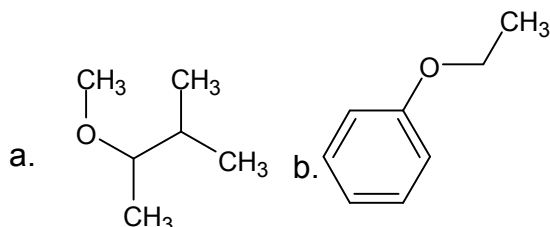
Time: 09:00-12:00

PART - A

Answer ALL the questions.

(10 x 2 = 20 marks)

- Classify the following halides into primary, secondary, tertiary, and aryl halides:
a) 2-bromobutane, b) 2-methyl-1-bromopropane, c) 2-methyl-2-chloropropane, d) iodobenzene
- Arrange the following halides in the increasing order of S_N1 reactivity.
1-chlorobutane, 2-chlorobutane, 2-methyl-2-chlorobutane, benzyl chloride
- Which of the following will not undergo haloform reaction? ethanol, methanol, isopropanol, 1-propanol.
- Write the mechanism of acid catalysed hydration of ethene to ethanol.
- Write the IUPAC names of the following ethers.



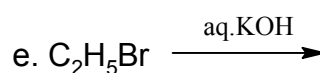
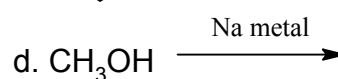
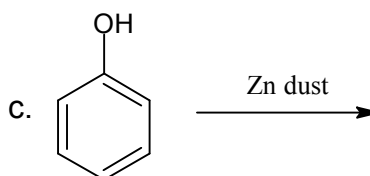
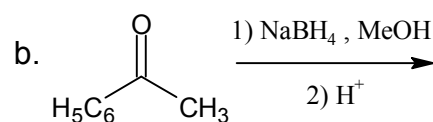
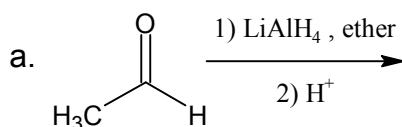
- How is ethanol converted to diethyl ether?
- Illustrate benzoin condensation.
- Write the structure of the following compounds: a) benzyl ethyl ketone b) 4-oxo pentanal.
- Mention a test to show the acidic nature of carboxylic acids.
- Predict the products formed when benzoic acid reacts with
a) sodalime b) ethanol in the presence of dil. H_2SO_4

PART - B

Answer any EIGHT questions.

(8 x 5 = 40 marks)

- State Saytzeff's and Hoffmann's rules with apt examples.
- Compare and contrast S_NAr mechanism and S_N2 mechanism.
- Explain Kolbe's reaction with mechanism.
- Predict the major product of the following reactions:



15. How is phenol prepared from a) cumene (isopropyl benzene) and b) aniline ? (3+2)
16. Write any one method to prepare ethylene oxide. What happens when it reacts with
a) acetic acid b) methyl magnesium iodide, H_3O^+ c. $\text{H}_2\text{O}/\text{H}^+$? (2+3)
17. Predict the products of the following reactions and justify their formation.
- a. $\xrightarrow{\text{HI}}$?
- b. $\xrightarrow{\text{HI}}$?
- (2+3)
18. Illustrate Norrish type-I and type II reactions.
19. Write a note on the action of heat on hydroxy carboxylic acids.
20. Explain the mechanism of Wittig reaction and bring out its synthetic importance.
21. Write any one method each to prepare Phthalic acid and succinic acid.
22. Convert a) acetone to acetic acid, b) phenyl cyanide to benzoic acid, c) acetic acid to methane (2+2+1)

PART – C

Answer any FOUR questions.

(4 x 10 = 40 marks)

23. a) Explain $\text{S}_{\text{N}}1$ mechanism with a suitable example.
b) Compare E_1 and E_2 mechanistic pathways. (5+5)
24. a) Phenol undergoes nitration forming ortho and para nitro phenols. Explain the formation of these products with mechanism. (5)
b) Account for the following :
i) Phenoxide ion is more stable than phenol
ii) Phenol does not undergo Friedl-Crafts' reaction.
iii) Alcohol possesses higher boiling point than the hydrocarbons of similar molar mass. (2+2+1)
25. a) Discuss alkoxymercuration and demercuration with an example. (5)
b) Using Williamson's ether synthesis, prepare the following ethers:
i) phenyl methyl ether ii) tert-butyl methyl ether. (3+2)
26. a) Predict the products and explain with mechanism.
- (5)
- b) Give the products formed when benzaldehyde reacts with the following reagents.
i) NH_2OH , ii) NaHSO_3 , iii) Zn/Hg and con. HCl . (1+2+2)
27. a) Bring out the mechanism of alkaline hydrolysis of an ester. (5)
b) Addition of Br_2 to maleic and fumaric acids gives different products. Explain their formation. (5)
28. a) Explain Reformatsky reaction with mechanism. (5)
b) Arrange the following in the order specified and give reason.
i) Fluoro acetic acid, acetic acid, formic acid, difluoro acetic acid, trifluoro acetic acid (increasing K_a values)
ii) benzoic acid, 4-nitro benzoic acid, 4-methoxy benzoic acid, 2, 4-dinitro benzoic acid (decreasing acidic strength) (3+2)

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