FYUG/Sem-4/CH-CE1

2026
(Regular)
Chemistry (Core)
Paper Code : CH-CE-4214
Paper Name : Organic Chemistry

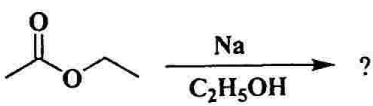
Time : 2 hours ***Full Marks : 45***

The figures in the margin indicate full marks for the questions.

1. Answer the following questions : 1×4=4
   a) Name the chemical test which is used to distinguish among *1°*, *2°* and *3°* alcohols.
   b) What is the advantage of using $SOCl_2$ instead of PCl_5 during preparation of acid chlorides ?
   c) What is Jones reagent ?
   d) What happens when potassium phenoxide is treated with ethyl bromide ?
2. Answer the following questions : 2×3=6
   a) Explain why phenols are more acidic than alcohols.
   b) Draw the keto-enol tautomers of butan-2-one and indicate their stability.
   c) What is a conjugate addition reaction ? Give an example.
3. Answer the following questions ***(any three)*** : 5×3=15

a) Propose a mechanism for the acid-catalysed adol condensation of propan-2-one. Can benzaldehyde undergo aldol condensation ? - Explain. 3+2=5

b) Predict the products of the following reactions : 1×5=5

i) 

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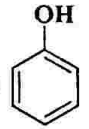
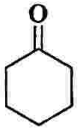
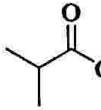
ii)  $\xrightarrow[\text{aq. NaOH}]{CHCl_3}$?

iii)  $\xrightarrow{I_2, NaOH}$?

iv)  $\xrightarrow[KOH, \Delta]{NH_2NH_2}$?

v)  $\xrightarrow[H_2O]{PBr_3, Br_2}$?

c) i) Arrange the following compounds according to their increasing order of reactivity and justify your answer : 1+2=3

CH_3COOH, CH_3COOCH_3, CH_3CONH_2, CH_3COCl

ii) Give the synthetic application of Hoffmann's degradation reaction. 2

d) i) What is PCC ? Give its synthetic application. 1+1=2

ii) $NaBH_4$ is considered as a mild, selective reducing agent than $LiAlH_4$. - Explain. 3

e) Why diethyl malonate is called an active methylene compound? Give one synthetic application of diethyl malonate. 1+4=5

f) Catalytic hydrogenation of alkynes by Lindlar's catalyst yield *cis*-alkenes, whereas dissolving metal reduction of alkynes yield *trans*-alkenes. - Explain. 5

4. Answer the following questions ***(any two)*** : 10×2=20

a) i) What is a Reformatsky reagent ? How is it formed ? Why Reformatsky reagent does not undergo nucleophilic addition to ester group in Reformatsky reaction ? 1+2+1=4

ii) Give comparison between the alkaline hydrolysis and acidic hydrolysis of esters. 6

b) Give one general method of preparation of the following compounds : 2×5=10

i) Phenol

ii) Ether

iii) Ketone

iv) Acid chloride

v) Acid anhydride

c) Provide two examples each of saturared, unsaturated and aromatic dicarboxylic acids respectively with their structures. Give one characteristic reaction for each type of dicarboxylic acids. 6+4=10

d) How will you carry out the following conversions ? 2½×4=10

i) Phenol to salicylic acid

ii) Benzaldehyde to benzoin

iii) Butyric acid to methyl butyrate

iv) Propanoic acid to propanamide

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