

3 SEM TDC CHMH (CBCS) C 6

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(Nov/Dec)

CHEMISTRY

(Core)

Paper : C-6

(Organic Chemistry)

Full Marks : 53

Pass Marks : 21

Time : 3 hours

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

1. Select the correct answer : 1×5=5

(a) Addition of HBr to 2-methylpropene in presence of benzoyl peroxide mainly forms

- (i) 1-bromobutane
- (ii) 2-bromobutane
- (iii) 2-bromo-2-methylpropane
- (iv) 1-bromo-2-methylpropane

(2)

- (b) Lucas reagent is a mixture of
- $\text{ZnCl}_2 + \text{HCl}$
 - $\text{Zn} + \text{HBr}$
 - $\text{Pd} + \text{HCl}$
 - $\text{Zn}(\text{Hg}) + \text{Cl}$
- (c) Malaprade reagent used to detect vicinal diol is
- OsO_4
 - H_5IO_6
 - $\text{Pd}(\text{OAc})_4$
 - Peracetic acid
- (d) The intermediate in the acid-catalyzed dehydration of alcohol is
- carbene
 - carbanion
 - carbocation
 - free radical
- (e) Which of the following compounds has the highest acid strength?
- ClCH_2COOH
 - Cl_2CHCOOH
 - Cl_3CCOOH
 - HCOOH

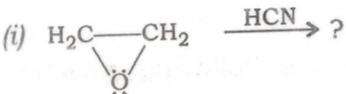
(3)

UNIT—I

Answer any five of the following questions :
2×5=10

- (a) What is $\text{S}_{\text{N}}1$ mechanism? Explain with a suitable example. 1+1=2
- (b) Discuss the benzyne mechanism for nucleophilic aromatic substitution reaction. 2
- (c) Which one of the following reacts faster in $\text{S}_{\text{N}}1$ reaction and why? 2



- (d) Synthesize the following (any one) : 2
- Ethyl bromide by Hunsdiecker reaction
 - Fluorobenzene through diazonium salt
- (e) Complete the following reactions : 1×2=2
-  ?
 - $(\text{CH}_3)_3\text{C}-\text{MgX} \xrightarrow[\text{Ether}]{\text{O}_2} ? \xrightarrow[\text{H}_2\text{O}]{\text{H}^+} ?$
- (f) Why are the aryl halides less reactive towards nucleophilic substitution reactions than alkyl halides? 2

(4)

UNIT—II

3. Answer any *three* of the following questions :

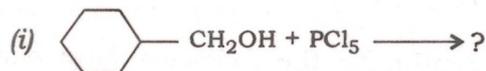
2×3=6

(a) How will you distinguish between 1°, 2°- and 3°-alcohols by Victor-Meyer method?

(b) Prepare acrolein from glycerol.

(c) How would you synthesize α , β -unsaturated aldehyde from glycerol?

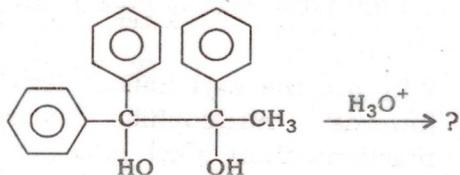
(d) Complete the following reactions : 1×2=2



4. Answer any *two* of the following questions :

3×2=6

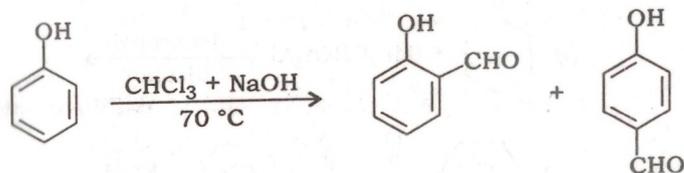
(a) Complete the following reaction with mechanism :



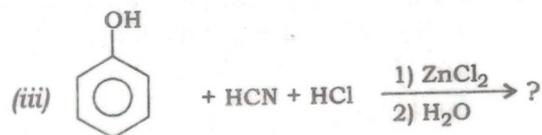
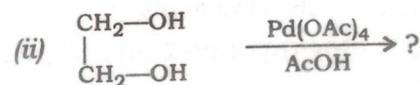
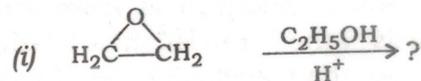
(5)

(b) (i) How can you prepare phenol from cumene? Give the mechanism.

(ii) Give the mechanism of the following reaction :



(c) Complete the following reactions :

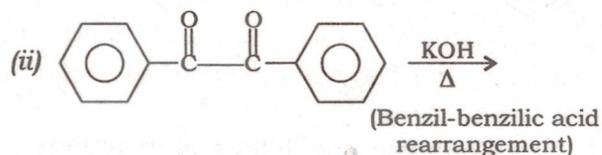
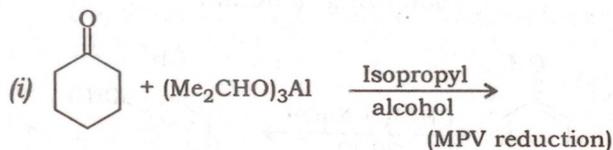


(6)

UNIT—III

Answer either Q. No. 5 or Q. No. 6

5. (a) Complete the following reactions and write down the mechanisms : $3 \times 2 = 6$



- (b) Trichloroacetaldehyde is more reactive towards the nucleophilic addition reaction than acetaldehyde. Explain. 2

6. (a) Synthesize the following : 3
2,3-dimethyl-but-2-ene by Wittig reaction

- (b) Write one synthetic application of each of the following reagents (any three) : $1 \times 3 = 3$

- (i) LiAlH_4
(ii) $\text{Pb}(\text{OAc})_4$
(iii) NaBH_4
(iv) p.c.c.

- (c) Write the Rosenmund's reaction for synthesis of acid chlorides. 2

(7)

7. Answer any two of the following questions : $2 \times 2 = 4$

- (a) Synthesize the following (any one) :
(i) Methyl vinyl ketone from acetone
(ii) Crotonaldehyde from acetaldehyde
- (b) Write a short note on keto-enol tautomerism.
- (c) What is Michael reaction? Explain with a suitable reaction.

8. How is barbutaric acid prepared using malonic ester? 1

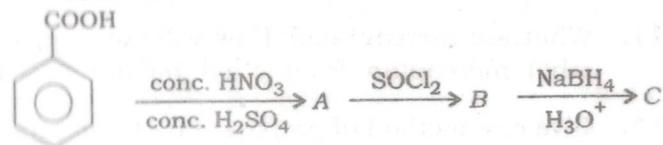
Or

Write any one preparation method of acetoacetic ester.

UNIT—IV

Answer either Q. No. 9 or Q. No. 10

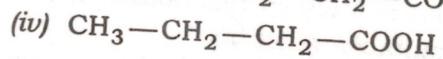
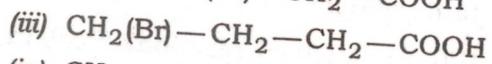
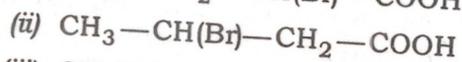
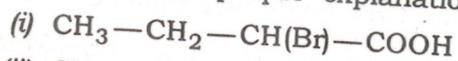
9. (a) "Carboxylic acids have higher boiling point than the alcohols." Explain. 2
- (b) Identify A, B and C in the following reaction : 3



- (c) Synthesize the following : $2 \times 2 = 4$
(i) Butanoyl chloride to propanoic acid by Curtius rearrangement

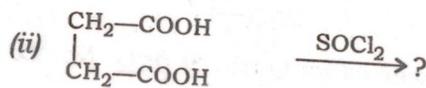
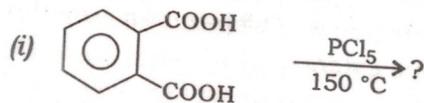
(ii) Cinnamic acid from benzaldehyde by using Knoevenagel reaction

10. (a) Arrange the following acids in increasing order of their relative acid strengths with proper explanations : 2



(b) Discuss the mechanism of acid-catalyzed hydrolysis of ester. 3

(c) Complete the following reactions : $1 \times 2 = 2$



(d) How would you synthesize lactic acid from propene? 2

UNIT—V

11. What are mercaptans? How will you prepare ethyl mercaptan from ethyl halide? $1+1=2$

12. Give one method of preparation of thio-ether. What happens when a thiol reacts with an aldehyde in presence of HCl? $1+1=2$

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