

Total No. of Printed Pages—11

3 SEM TDC CHMH (CBCS) C 6

2023

(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. Choose the correct answer from the following : 1×5=5
- (a) Hunsdiecker reaction is governed by
- (i) ionic mechanism
 - (ii) ionic and free radical mechanism
 - (iii) free radical mechanism
 - (iv) None of the above

(2)

(b) When (-)-2-bromo octane is treated with NaOH, the product is (+)-2-octanol. This inversion of configuration shows by

- (i) S_N1 mechanism
- (ii) S_N2 mechanism
- (iii) S_Ni mechanism
- (iv) None of the above

(c) Malaprade reagent used to detect vicinal diol is

- (i) OsO₄
- (ii) H₅IO₆
- (iii) Pb(OAc)₄
- (iv) peracetic acid

(d) Phenyl acetate when heated with anhydrous AlCl₃ gives *o*- or *p*-hydroxy acetophenone. This reaction is known as

- (i) allyl rearrangement
- (ii) Claisen rearrangement
- (iii) Fries rearrangement
- (iv) None of the above

(3)

(e) Which one of the following compounds will give Cannizzaro's reaction?

- (i) CH₃CHO
- (ii) C₆H₅CH₂CHO
- (iii) (CH₃)₃C—CHO
- (iv) CH₃CH₂CHO

UNIT—I

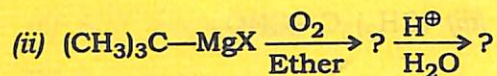
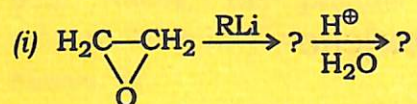
2. Answer any *five* of the following questions :

2×5=10

- (a) Giving a suitable example, show that in an S_N2 reaction inversion takes place.
- (b) Discuss the relative reactivity of alkyl, allyl and aryl halides towards nucleophilic substitution reactions.
- (c) Give the elimination-addition mechanism of conversion of chlorobenzene into aniline.

(4)

(d) Complete the following reactions :



(e) Synthesize the following :

(i) Ethyl bromide by Hunsdiecker reaction

(ii) Fluorobenzene through diazonium salt

(f) Which one of the following reacts faster in $\text{S}_{\text{N}}1$ reaction and why?



(5)

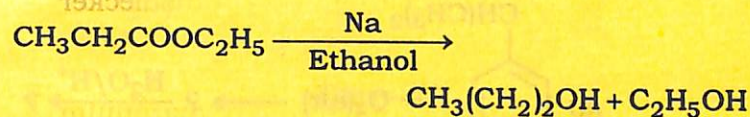
UNIT—II

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

2×3=6

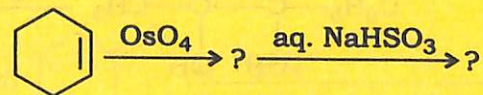
(a) How would you synthesize α , β -unsaturated aldehyde from glycerol?

(b) Give the mechanism of the following reaction :



(c) With the help of Victor Meyer test, how will you distinguish between 1° , 2° and 3° alcohols?

(d) Complete the following reaction :

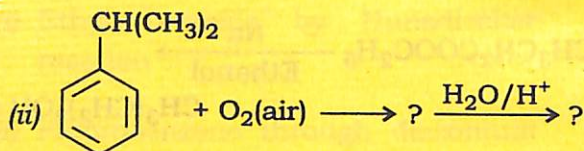
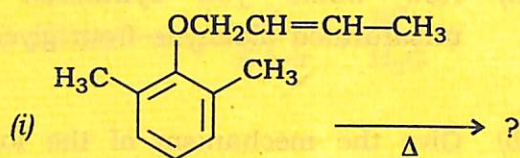


(6)

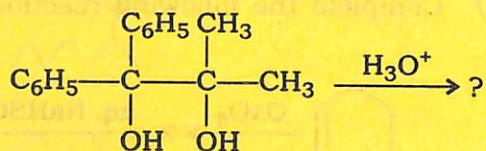
4. Answer any two of the following questions :

3×2=6

(a) Complete the following reactions with mechanisms :

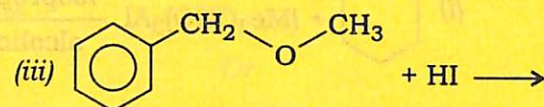
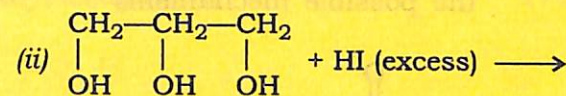
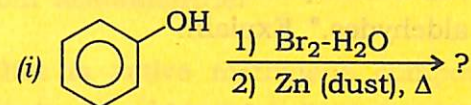


(b) Complete the following reaction and write down the possible mechanism :



(7)

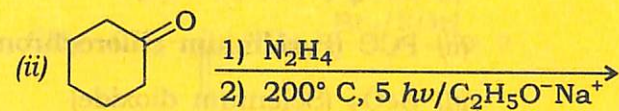
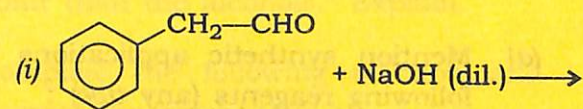
(c) Complete the following reactions :



UNIT—III

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

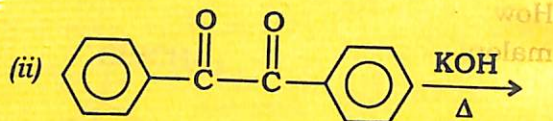
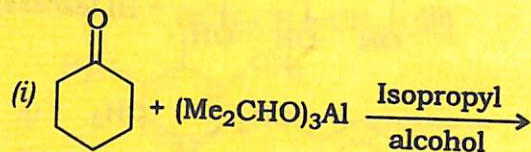
5. (a) Complete the following reactions and write down their mechanisms : 3×2=6



(8)

(b) "Aldol condensation leads to α, β -unsaturated aldehydes and not β, γ -unsaturated aldehydes." Explain. 2

6. (a) Complete the following reactions with the possible mechanisms : $3 \times 2 = 6$



(b) Synthesize the following : 2
2,3-dimethylbut-2-ene by Wittig reaction.

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

(a) Mention synthetic applications of the following reagents (any two) : $1 \times 2 = 2$

(i) HIO_4 (Periodic acid)

(ii) PCC (Pyridinium chlorochromate)

(iii) SeO_2 (Selenium dioxide)

(9)

(b) How can you prepare crotonaldehyde from acetaldehyde? 2

(c) What is active methylene compound? Show the keto-enol tautomerism in ethylacetoacetate. $1+1=2$

8. Synthesize methyl vinyl ketone from acetone. 1

Or

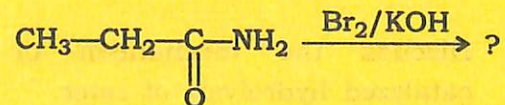
How is barbutaric acid prepared using malonic ester?

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) Complete the following reaction and suggest the mechanism : 3



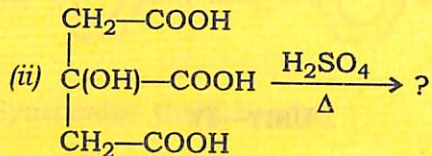
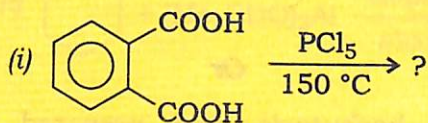
(10)

(c) Synthesize the following : $2 \times 2 = 4$

(i) Citric acid from glycerol

(ii) Cinamic acid from benzaldehyde by using Knoevenagel reaction.

10. (a) Complete the following reactions : $1 \times 2 = 2$



(b) How would you synthesize the following? $2 \times 2 = 4$

(i) Cyclopentanone from esters of adipic acid by Dieckmann reaction

(ii) Lactic acid from propene

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

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(Continued)

(11)

UNIT—V

11. What are thioethers? How do you obtain diethyl thioether from ethyl mercaptan? What happens when a thioether is oxidized with H_2O_2 ? $\frac{1}{2} + \frac{1}{2} + 1 = 2$

12. Which is the stronger acid, ROH or RSH? Give reason for your answer. $1 + 1 = 2$
