

**2025/TDC(CBCS)/ODD/SEM/
CHMHCC-302T/433**

TDC (CBCS) Odd Semester Exam., 2025

**CHEMISTRY
(3rd Semester)**

Course No. : CHMHCC-302T

**[Organic Chemistry—II (Halogen and Oxygen
Containing Functional Groups)]**

Full Marks : 50
Pass Marks : 20

Time : 3 hours

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

UNIT—I

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

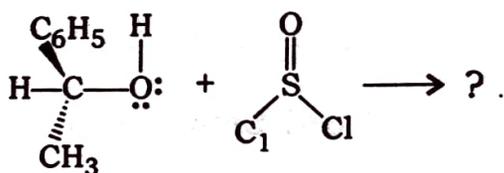
2×2=4

- (a) Explain why racemization of products occurs in S_N1 reaction.
- (b) Explain with proper reason, the relative reactivity of the following molecules towards nucleophilic substitution reaction :



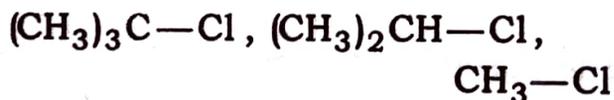
(2)

- (c) Predict the stereochemical outcome of the following reaction and explain the mechanism :

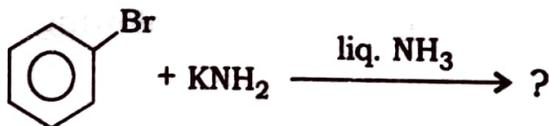


2. Answer any *one* of the following questions : 6

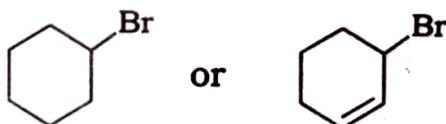
- (a) (i) Explain the order of reactivity of the following alkyl chlorides towards OH⁻ (aq) by S_N2 mechanism : 2



- (ii) Predict the product of the following reaction with proper mechanism : 3



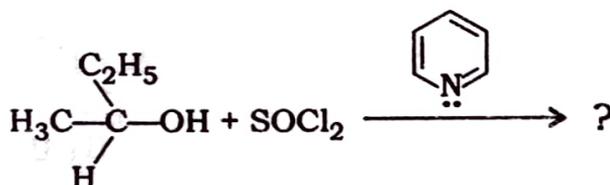
- (iii) Explain which amongst the two shows faster reactivity in S_N1 reaction : 1



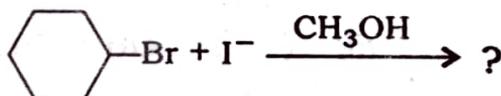
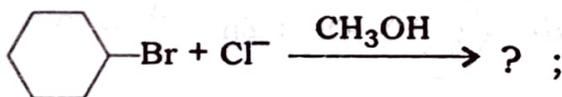
(3)

(b) (i) "Aryl halides do not undergo nucleophilic substitution reactions easily as compared to alkyl halides." Give reason why. 2

(ii) Explain the product of the following reaction with appropriate mechanism and stereochemical outcome : 3



(iii) Which of the following will undergo higher $\text{S}_\text{N}2$ reaction rate and why? 1

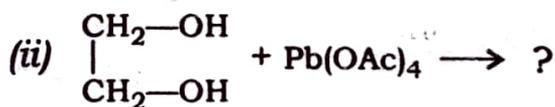
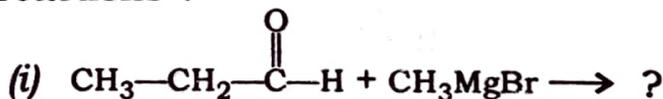


UNIT—II

3. Answer any two of the following questions :

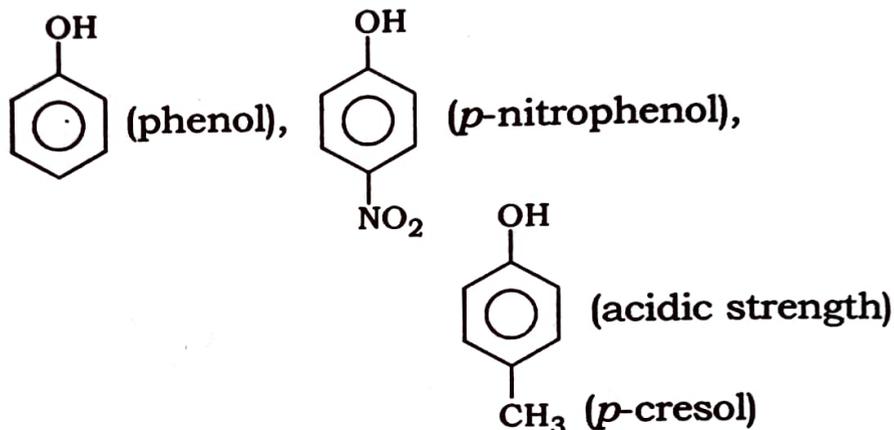
2×2=4

(a) Predict the products of the following reactions :

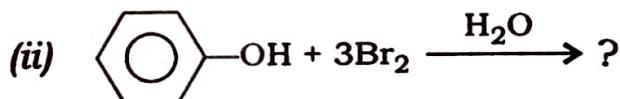
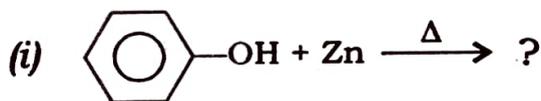


(4)

(b) Arrange the following compounds in order of their increasing acidic strength and provide the reason :



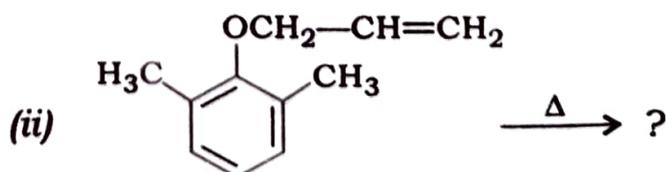
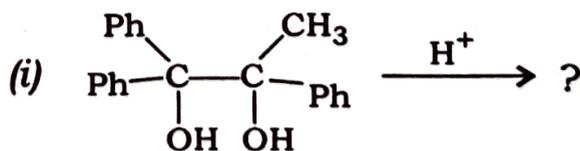
(c) Predict the products of the following reactions :



4. Answer any one of the following questions : 6

(a) Give the products of the following reactions with plausible mechanisms :

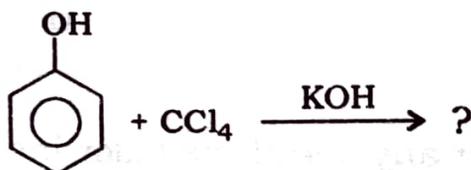
3×2=6



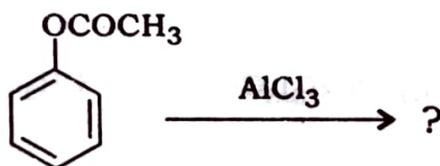
(5)

(b) (i) Explain why phenols undergo electrophilic substitution reaction much more readily than benzene. 2

(ii) Write the product of the following reaction : 1



(iii) Predict the product of the following reaction and provide the plausible mechanism : 3



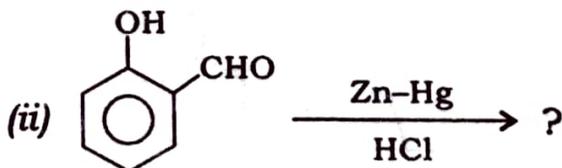
UNIT—III

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

2×2=4

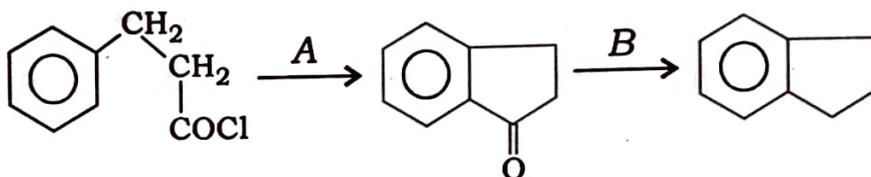
(a) "Aldehydes are more reactive than ketones towards nucleophilic addition reaction." Explain.

(b) Give the products of the following reactions :



(6)

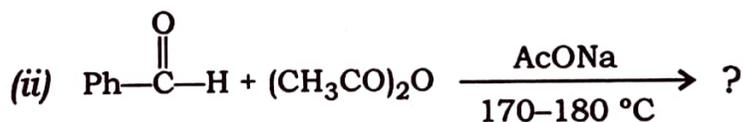
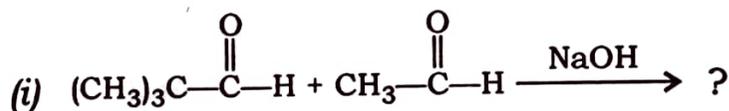
(c) Predict A and B in the following reaction :



6. Answer any one of the following questions : 6

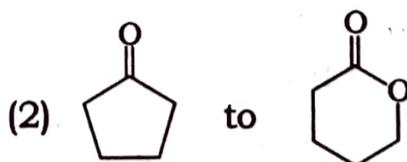
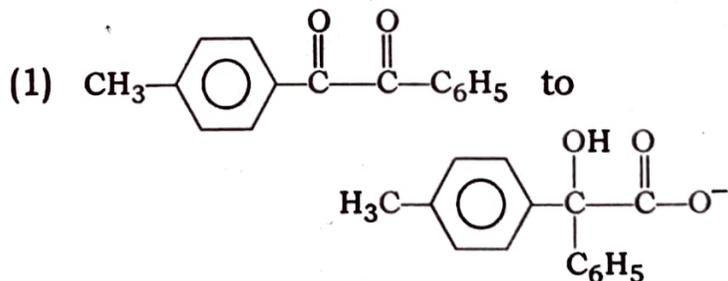
(a) Predict the products of the following reactions with plausible mechanisms :

3×2=6



(b) (i) Suggest the plausible mechanisms for the following transformations :

2+3=5



(7)

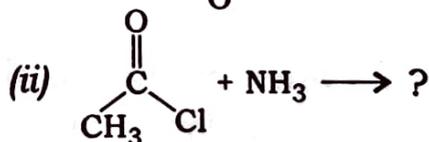
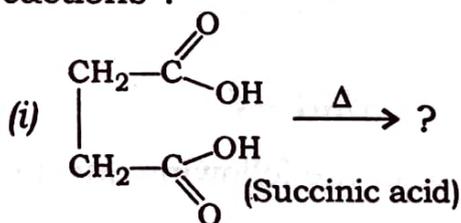
- (ii) Give the product of the following reaction : 1



UNIT—IV

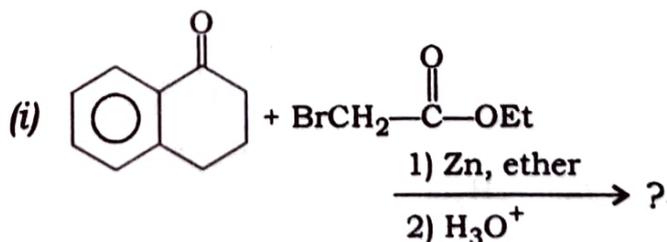
7. Answer any *two* of the following questions : 2×2=4

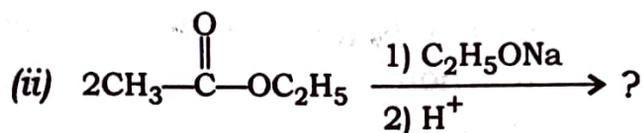
- (a) Why is *p*-methoxybenzoic acid weaker than benzoic acid?
- (b) Describe Hoffmann bromamide reaction with mechanism.
- (c) Give the products of the following reactions :



8. Answer any *one* of the following questions : 6

- (a) Predict the products of the following reactions with mechanisms : 3×2=6





- (b) (i) Convert the following transformation with plausible mechanism : 3



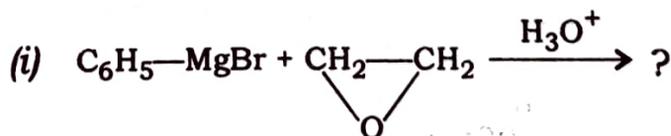
- (ii) Explain Dieckmann reaction with proper mechanism. 2
- (iii) At ordinary temperature malic acid forms anhydride but fumaric acid does not. Explain. 1

UNIT—V

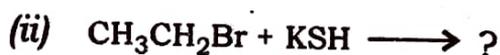
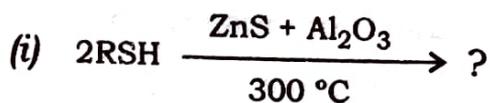
9. Answer any *two* of the following questions :

2×2=4

- (a) What happens when propyne is treated with CH_3MgBr and followed by reaction with CH_3-Br ?
- (b) Predict the products of the following reactions :



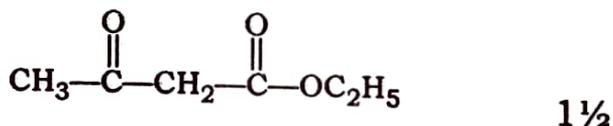
(c) Predict the products of the following reactions :



10. Answer any one of the following questions : 6

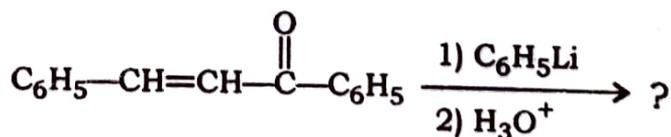
(a) (i) Explain why the methylenic hydrogens in ethylacetoacetate is acidic in nature. 1½

(ii) Write the various tautomeric forms of



(iii) Write down the several steps for forming succinic acid from diethyl malonate. 3

(b) (i) Complete the following reaction and suggest plausible mechanism : 2



(10)

(ii) Suggest the plausible mechanism

for the conversion of $\text{C}=\overset{\text{O}}{\text{O}}$ to

$\begin{array}{l} \text{R} \\ \diagdown \\ \text{C}=\text{O} \\ \diagup \\ \text{R} \end{array}$ by using RLi.

2

(iii) Suggest the preparation of 4-methyl
uracil from ethylacetoacetate.

2
