

Ex/SC/CHEM/UG/CORE/TH/06/2024

**B. Sc. CHEMISTRY EXAMINATION, 2024**

**(3<sup>rd</sup> Semester)**

**CHEMISTRY (CORE)**

**PAPER : CORE/CHEM/TH/06**

*Time : Two Hours*

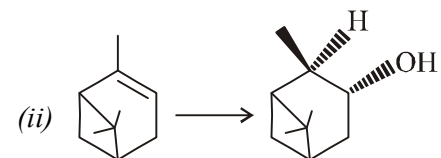
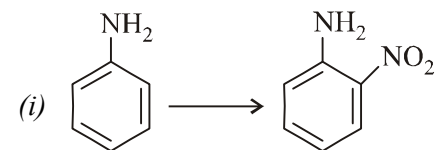
*Full Marks : 40*

*( 20 marks for each Unit )*

*Use a separate answerscript for each unit.*

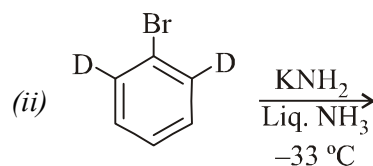
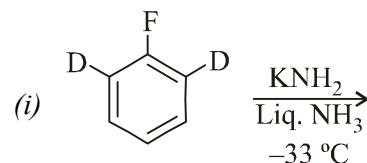
**UNIT—3061 – O**

**1. (a) Carry out the following transformations : 1×2**

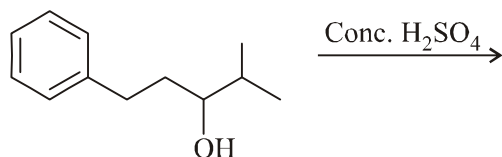


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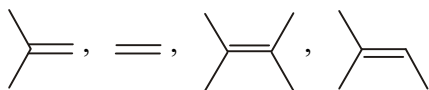
- (b) Predict the products of the following reactions with plausible mechanism : 1×2=2



- (c) Predict the major product in the following reaction with suitable explanation : 1½

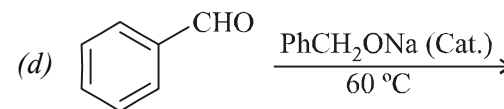
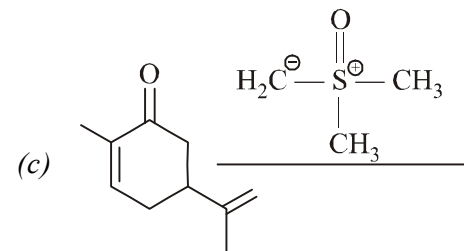
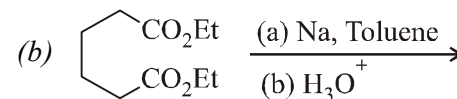


- (d) Compare the rates of bromination of the following alkenes with suitable explanation : 1½

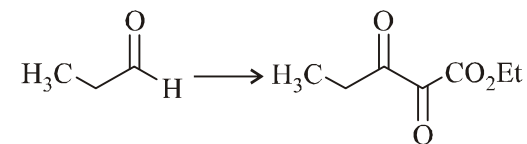


- (e) How will you utilize  $\text{S}_{\text{N}}2\text{Ar}$  reaction for the determination of N-terminal amino acid of a peptide chain? 1½

( 7 )



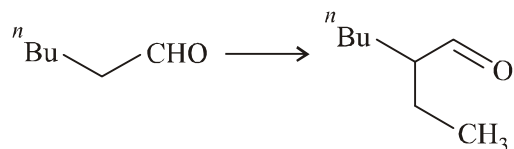
9. Carry out the following conversion through a thioacetal intermediate : 2



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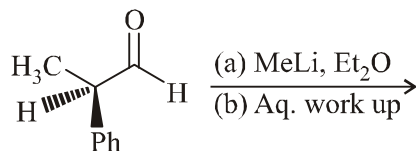
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5. Write down the proper reagents required in the following transformation : 1

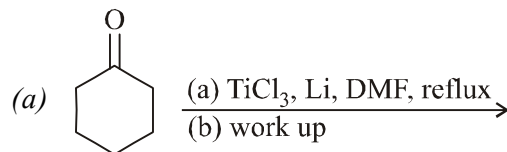


6. How would you identify the presence of an aldehyde group in an organic compound? Write all the chemical reactions involved in that. 2

7. Predict the product of the following reaction with stereochemistry. Draw the reacting conformation of the substrate according to the Felkin-Ahn model and show only the trajectory for the nucleophilic attack to the carbonyl functional group. 2



8. Predict the major product of the following reactions (Mechanism is not required) : 1×4

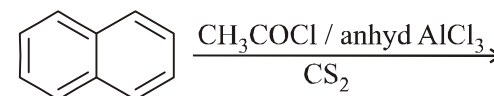


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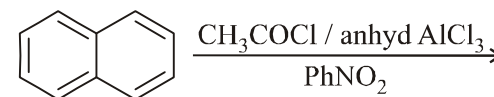
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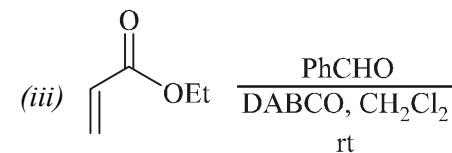
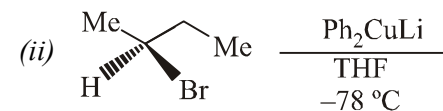
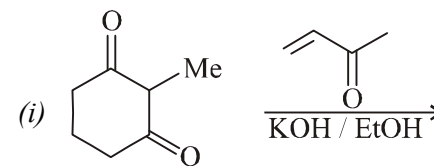
- (f) Predict the major product in the following Friedel-Crafts acylation reactions with suitable explanation : 1½



and



2. (a) Predict the products of the following reactions and draw the plausible mechanism in each case (any two) : 2×2



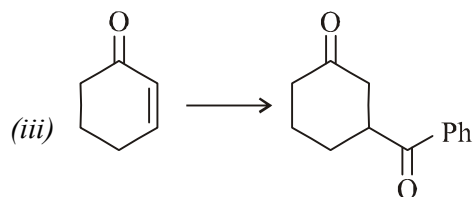
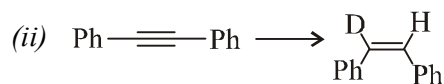
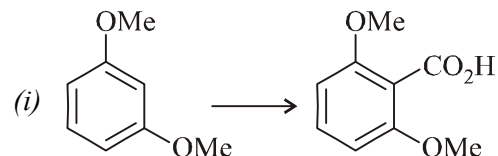
CHEM-9

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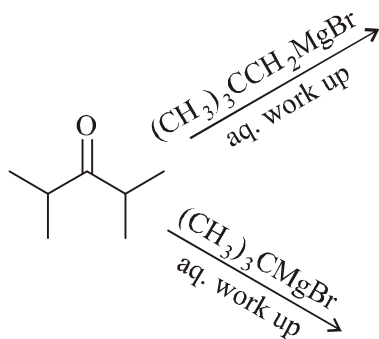
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- (b) How would you carry out following transformations?  
(Answer **any two**. Mechanism is not required)

1½×2



- (c) Predict the product(s) of the following reactions and mechanistically explain the formation of products with proper reasoning. 3



CHEM-9

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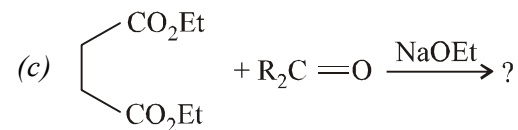
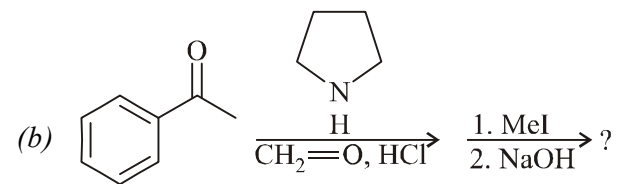
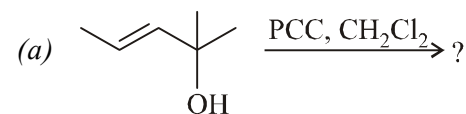
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UNIT—3062 – O

3. Answer **any two** of the following questions : 2½×2

- (a) Prove that Favorskii reaction proceeds through cyclopropanone intermediate.
- (b) Explain the role of dimethyl sulfoxide in Swern oxidation.
- (c) In case of enolization of the ketone  $\text{RCOCH}_2\text{CH}_3$  using LDA, the nature of R-group largely affects the stereoselectivity of the enolates. Give suitable explanation in support of this statement.

4. Write down the product of the following reactions with probable mechanism (**any two**) : 2×2



CHEM-9

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