B. Sc. Chemistry Examination, 2023

(3rd Semester, CBCS)

CHEMISTRY (CORE)

Paper: Core/Chem/Th/06

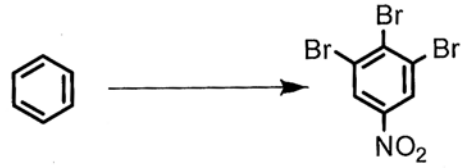
Time : Two Hours Full Marks : 40

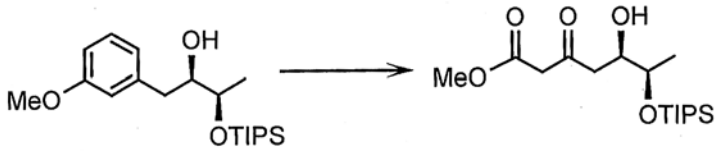
(20 marks for each unit)

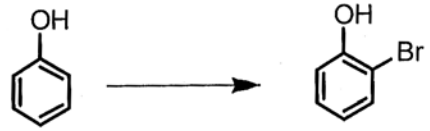
Use a separate answer script for each unit.

UNIT : 3061 - O

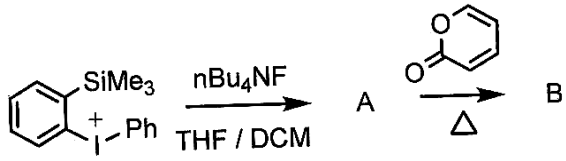
1. (a) Carry out the following transformations : $1^1/_2$x3

i) 

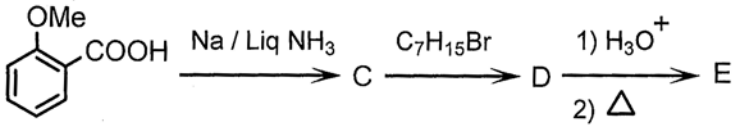
ii) 

iii) 

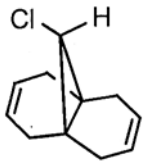
(b) Predict the products **A** and **B** formed in the following reaction with plausible mechanism. 1



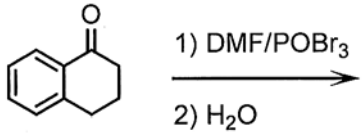
(c) Predict the products C-E in the following reaction with suitable explanation. $1\frac{1}{2}$



(d) What happens when the following molecule is treated with 1 equivalent of *meta*-chloroperbenzoic acid ? $1^1/_2$

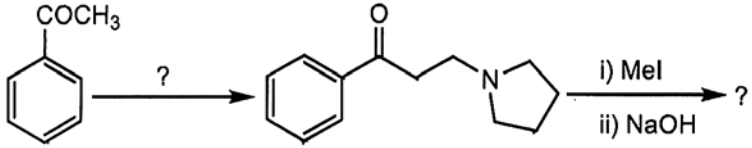


(e) Write down the product of the following reaction with mechanism. $1^1/_2$

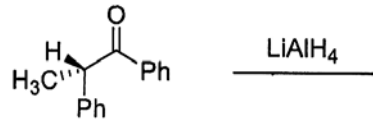


2. (a) What will happen when MeMgBr in Et_2O is separately treated with methyl vinyl ketone in the presence of CuI and in the absence of CuI, and subsequently the reaction mixture is quenched with aqu.NH4Cl. Explain the mechanism with suitable reason. 3

(b) Predict the products **F** and **G** in the following reaction sequences. 1

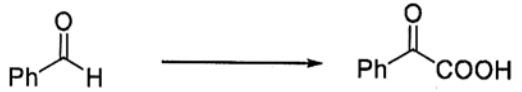


(b) Draw and illustrate Cram's Models for predicting the stereochemistry of the major product of nucleophilic addition to a carbonyl compound with an adjacent chiral center. Briefly mention its limitations.
Using the Crams model, predict the products with proper stereochemistry of the following reaction.

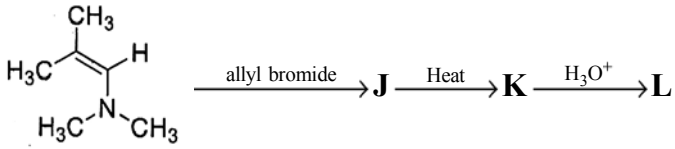


3+1+1

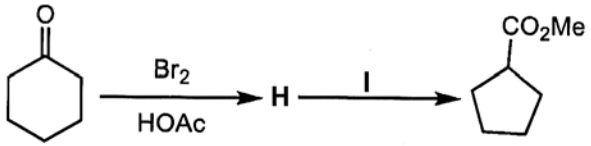
5. (a) Carry out the following conversions through a thioacetal intermediate. 2



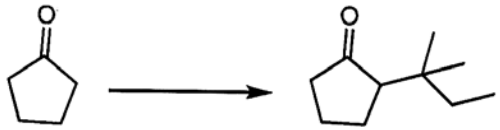
(b) Write the structure of the products **J**, **K** and **L** in the following reaction sequences and explain mechanistically. 3



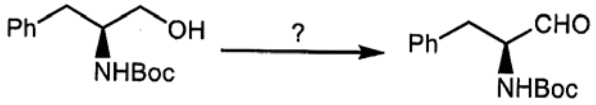
"compound-**H**" and the required "reagent-**I**" in the following sequence of reactions. 3



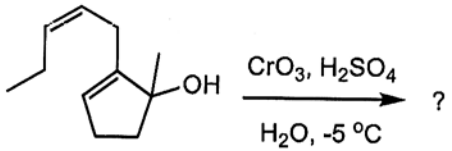
(b) Discuss a suitable pathway for the following conversion. 2



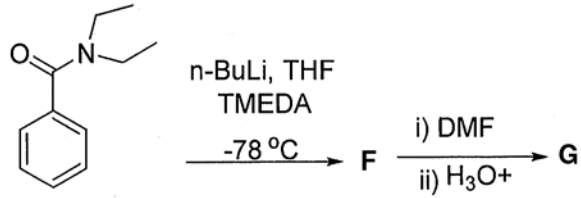
(c) Select a suitable metal-free reagent for the following conversion. Show the mechanism. 2



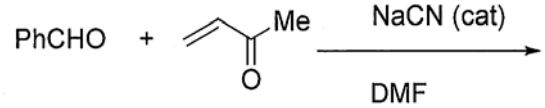
(d) Write down the product with probable mechanism. 2

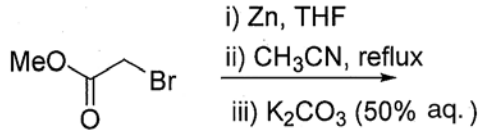


4. (a) Write down the missing reagent and the product in the following sequence of reactions (mechanism not required). 1

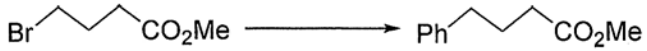


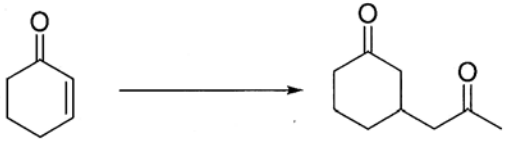
(c) Predict the products and propose the plausible mechanism of the following reactions. 2×2

i) 

ii) 

(d) How would you carry out following transformations ? (Attempt any ***one***) 2

i) 

ii) 

UNIT - 3062 - O

3. (a) With mechanism, write down the structure of