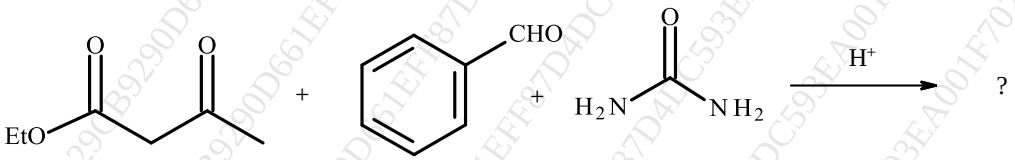
2.5 hours **[Total Marks: 60]**

N.B. 1) All questions are **compulsory**.
2) **Figures** to the **right** indicate **full marks**.

1. A Attempt **any two** of the following: **8**

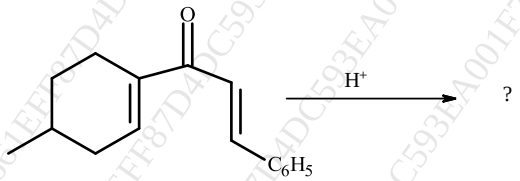
i) Complete the following reaction



Name the reaction and explain its mechanism.

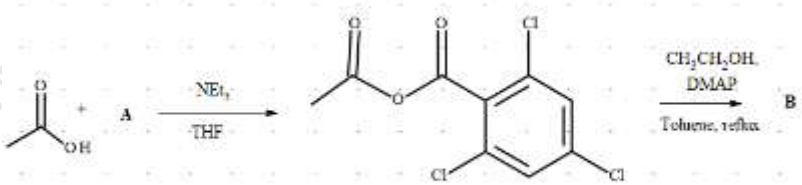
ii) Give one example each of the following
Mitsonobu reaction
Pictet-Spengler synthesis
Mukaiyama reaction
Ritter reaction

iii) Give the product, name and mechanism of the following reaction.



iv) Complete the following reactions. Give the name of each of the reactions.

$CH_3COOH + C_2H_5NH_2 + C_6H_5CHO + CH_3NC \longrightarrow ?$



B Attempt **any one** of the following: **4**

i) What are the components of the Darzen's glycidic ester condensation? Write a suitable example of this reaction and explain its mechanism.

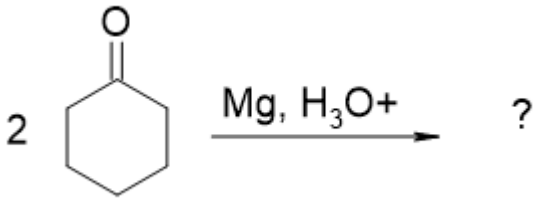
ii) What are the characteristics of a click reaction? Give an example of the Huisgen 1,3-dipolar reaction.

2. A Attempt **any two** of the following: **8**

i) Discuss with suitable example, intramolecular C-C bond formation using tributyltin-hydride.

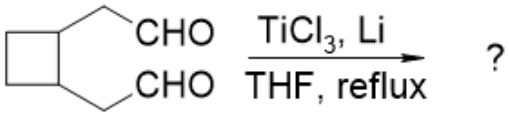
ii) Define radicals and discuss the characteristics of radicals.

iii) Predict the product, name the reaction and suggest the mechanism.



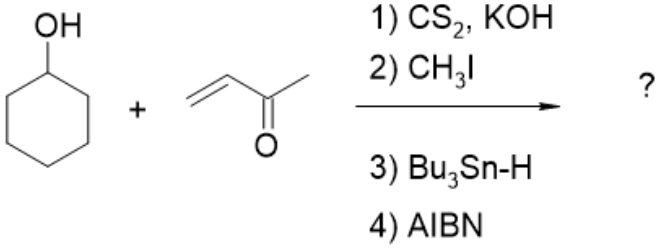
iv

Predict the product, name the reaction and suggest the mechanism.



B Attempt **any one** of the following: **4**

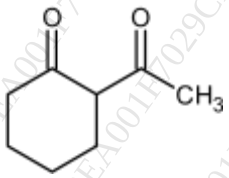
i) Predict the product and suggest the mechanism



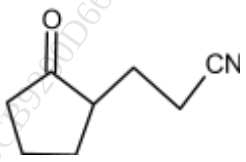
ii) Discuss with example, intramolecular C-C bond formation using N-hydroxy pyridine -2 thione.

3. A Attempt **any two** of the following: **8**

i) How are the following compounds prepared via enamine?



and



ii) What are S-ylides? How are they prepared? Give two applications of S-ylides in organic synthesis.

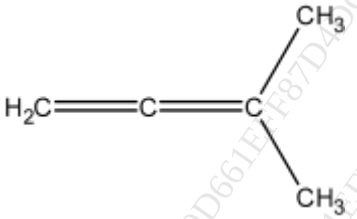
iii) How are alkenes prepared by coupling reaction between diazo compounds and ketones? Name the reaction involved.

iv) Explain the generation of carbanions in nitro compounds and phosphonates and give one application of each in C-C bond formation.

B Attempt **any one** of the following: **4**

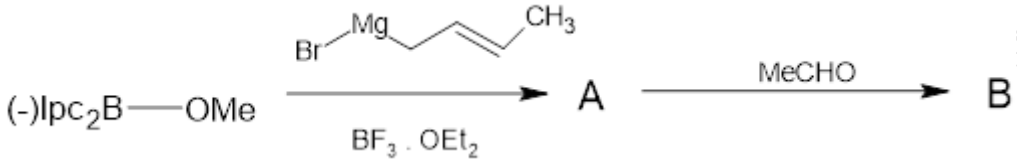
i) What is Steven's rearrangement? Illustrate with the mechanism and one application.

ii) Using phosphorus ylide, suggest synthesis of the following compound. Name the reaction involved and provide a mechanism for the same.

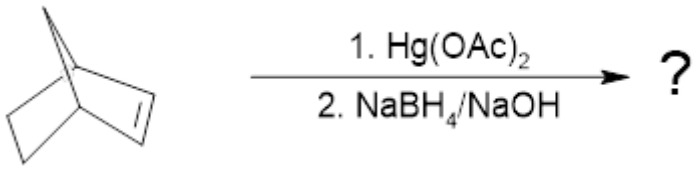


4. A Attempt **any two** of the following: **8**

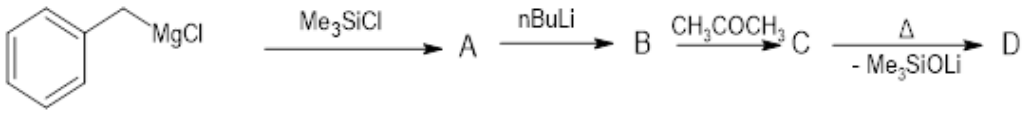
i) Complete the following reaction with correct stereochemistry and predict the mechanism.



ii) Complete the following reaction. Give the name and mechanism of the reaction.



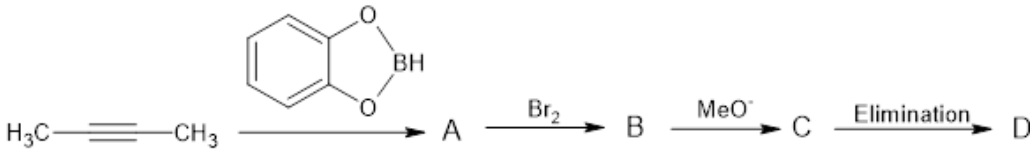
iii) Complete the following reaction by identifying A, B, C, and D.



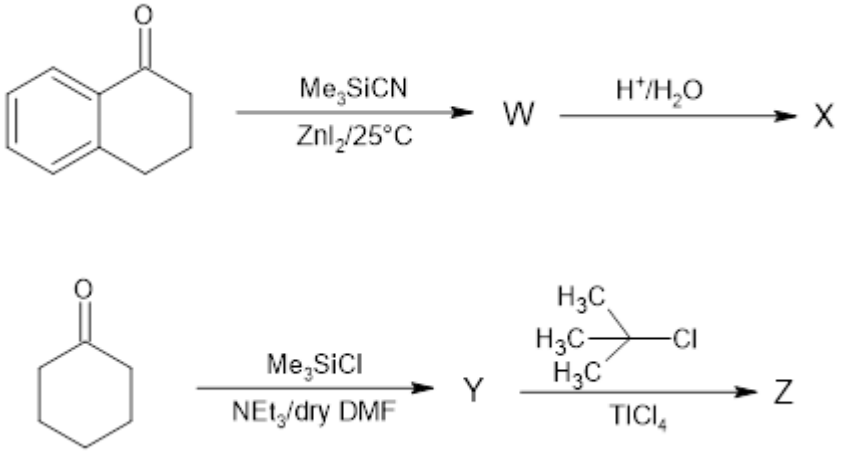
iv) Give the following conversion via selenoxide.

B Attempt **any one** of the following: **4**

i) Complete the following reaction and identify A, B, C and D.



ii) Complete the following reaction by identifying W, X, Y and Z.



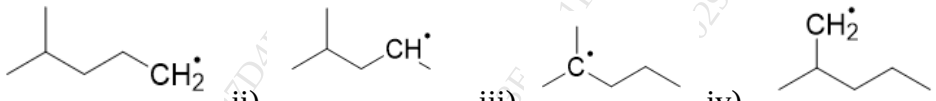
5. Answer **any four** of the following: **12**

(a) Which multicomponent reaction is useful in the synthesis of dihydropyridines? What are the components in this reaction? Write the equation for a suitable example.

(b) With a suitable example explain the mechanism for the Strecker reaction.

(c) Write the examples of persistent radical, electrophilic and nucleophilic radical.

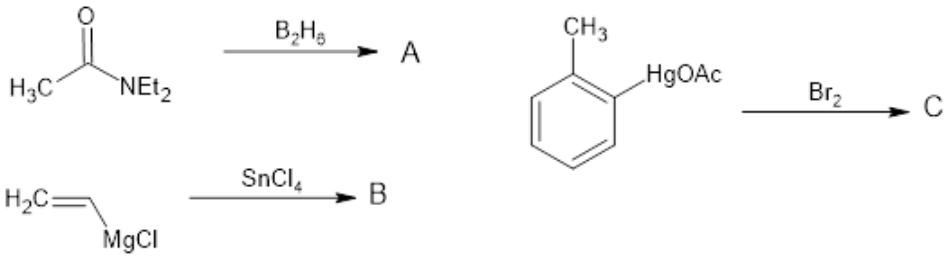
(d) Discuss the stability of following radicals and arrange it in increasing order of stability.



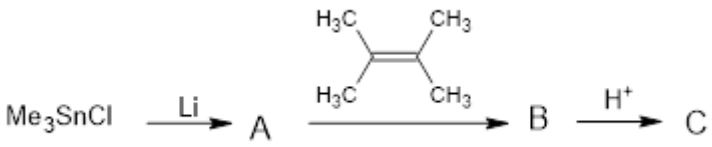
(e) Compare the reactivity of enamines and enolates.

(f) Write a brief note on Bestman Ohira reagent

(g) Complete the following reactions by identifying A, B and C.



(h) Complete the following reaction by identifying A, B and C.



****