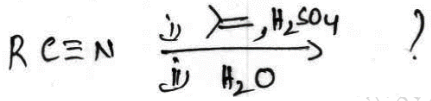
**[2½ Hours]** **[ Marks : 60]**

Please check whether you have got the right question paper.

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

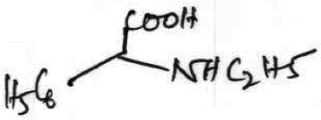
1. (a) Attempt **any two** of the following : **08**

i) Complete the following reaction. Give its name and draw its mechanism.

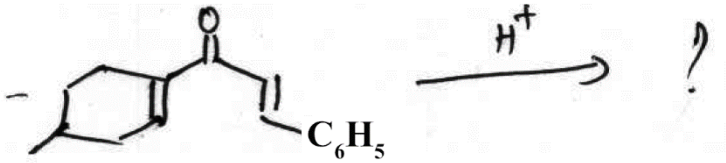


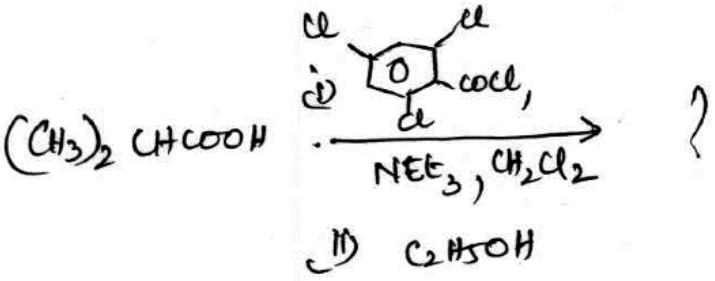
ii) Give one example each of
Darzen's glycidic ester synthesis
Peterson's olefination.

iii) What are multi component reactions? How will you synthesize the following using Strecker Synthesis?



iv) Give the product and name of the following reactions.

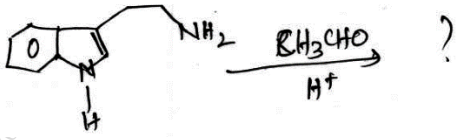




(b) Attempt **any one** of the following : **04**

i) What are the characteristics of Domino reactions? Explain the Nazarov Cyclisation.

ii) Identify the product, name the reaction and explain the mechanism for the following.



2. (a) Attempt **any two** of the following : **08**

i) Explain the following terms with a suitable example for each
Radical initiator
Electrophilic radical

ii) Give one example each of
Hunsdiecker reaction
McMurry coupling
Autooxidation
Oxidative coupling

iii) Discuss with suitable examples the generation of radicals by C-Co cleavage.

iv) Describe with suitable examples radical mediated C-C bond formation in aromatic compounds.

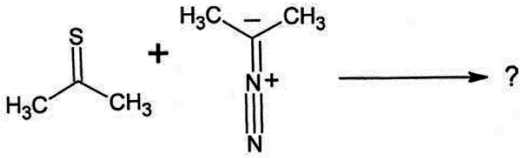
(b) Attempt **any one** of the following : **04**

i) With a suitable example explain the mechanism of Mukaiyama esterification.

ii) Give one example each of
Persistent radical
Free radical substitution
Radical cyclisation
Nucleophilic radical

3. (a) Attempt **any two** of the following : **08**

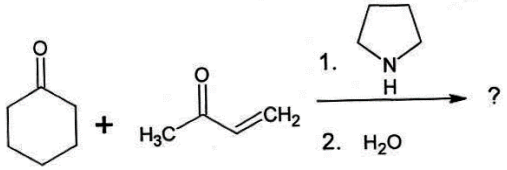
i) Complete the following reaction and give its name and mechanism.




ii) With suitable example, explain how alkenes are obtained from phenyl sulfones and aldehydes? Give name of the reaction.

iii) Explain with suitable examples C-C bond formation by generation of carbanions in nitro and phosphonate compounds.

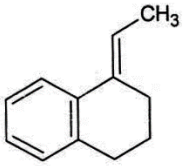
iv) Predict the product and name of the reaction. Discuss the mechanism involved.




(b) Attempt any **one** of the following : **04**

i) Write a note on Bamford-Stevens reaction.

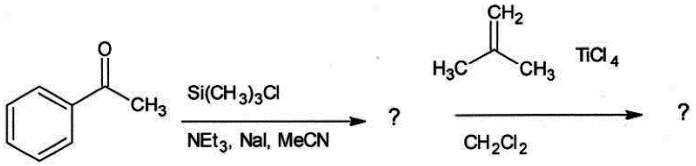
ii) Using phosphorus ylide, suggest the synthesis of following compound. Name the reaction involved and provide the mechanism.



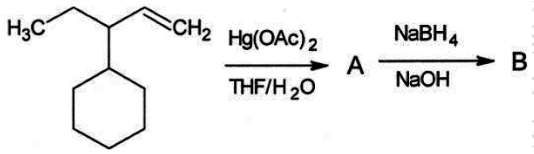
4. (a) Attempt **any two** of the following : **08**

i) Discuss the mechanism and stereochemistry of asymmetric hydroboration using chiral boron reagents.

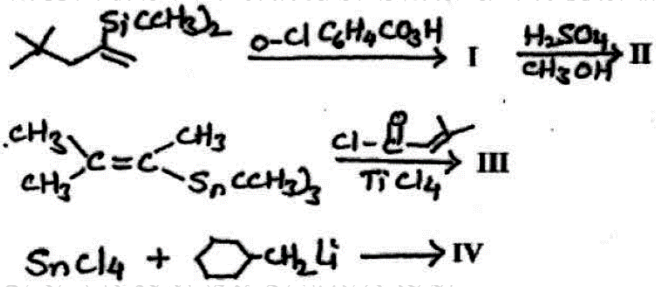
ii) Complete the following reaction and predict its name and mechanism.




iii) Complete the following reaction and predict its name and mechanism.

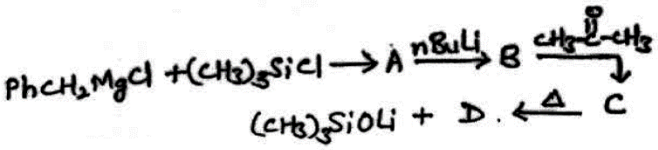



iv) Complete the following reactions and identity I, II, III and IV.




(b) Attempt any **one** of the following : **04**

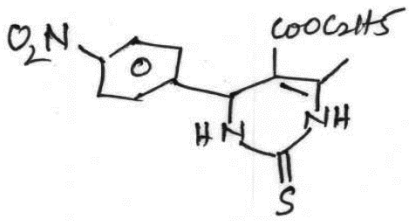
i) Complete the following reaction by identifying A, B, C and D.



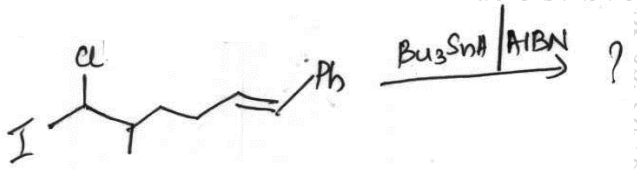

ii) Give the synthesis of 1,3-butadiene using $PhSeCH_3$.

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

i) How will you synthesize the following by Biginelli reaction




ii) Give the product and mechanism of the following reaction.




iii) Discuss the mechanism of Ugi 4 component reaction.

iv) With a suitable example, explain the mechanism of Acyloin condensation.

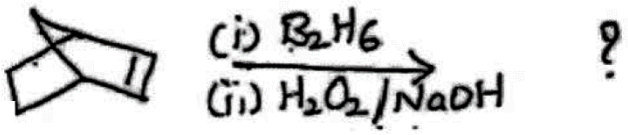
v) Complete the following reactions:

1. cyclohexanone + piperidine ⟶

2. cyclohexanone + morpholine ⟶

vi) Give structure of phosphorus and nitrogen ylides. Why are phosphorus ylides more stable than nitrogen ylides?

vii) Complete the following reaction and explain its mechanism.




viii) Give three applications of alkyl silanes in organic synthesis.

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