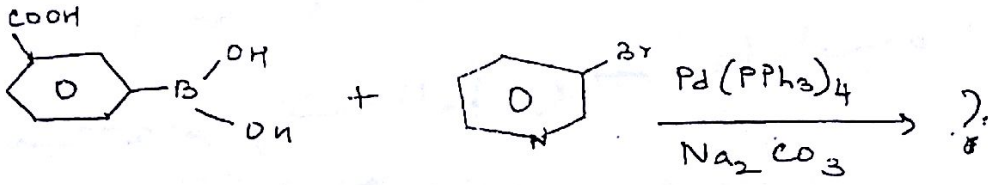
QP Code : **08305**

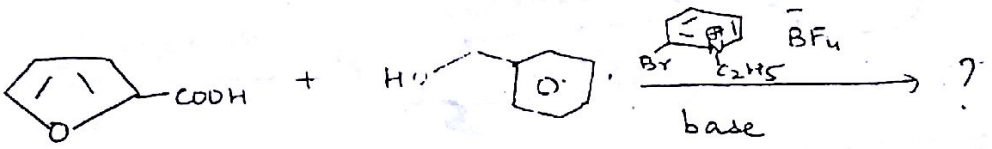
(2 ½ Hours) [Total Marks :60

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

1. (a) Give the product, name and mechanism of the following :— (any two)

(i) 

4

(ii) 

4

(iii) $CH_3COCH_2COOCH_3$ + 

+ NH_3 ⟶ ? 4

(iv) $CH_3CHO + C_6H_5COCH_2CO_2Et + NH_2\overset{O}{\overset{\|}{C}}NH_2 \xrightarrow[HCl]{EtOH}$? 4

(b) Attempt any one of the following :—
(i) What are domino reactions? Explain with suitable examples. 4
(ii) Give an example of
(I) Mitsunobu reaction 4
(II) Baylis-Hillman reaction
(III) Strecker synthesis
(IV) Sonogashira reaction

2. Attempt any two of the following :—
(i) Discuss the use of nitro compounds as acyl anion equivalent with suitable examples. 4
(ii) Give the product, name and mechanism of the following reaction : 4

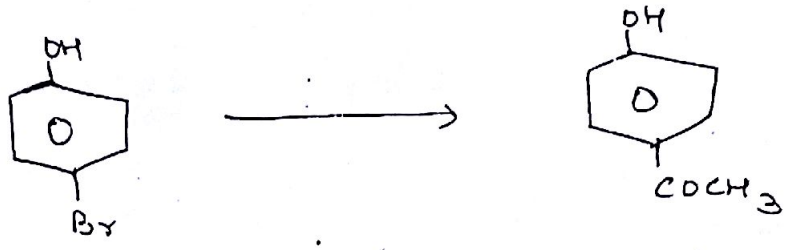
$2\ CH_3CH_2COO^-Na^+ \xrightarrow{\text{electrolysis}}$?

(iii) Discuss two methods of protection and deprotection of amino group with suitable examples. 4

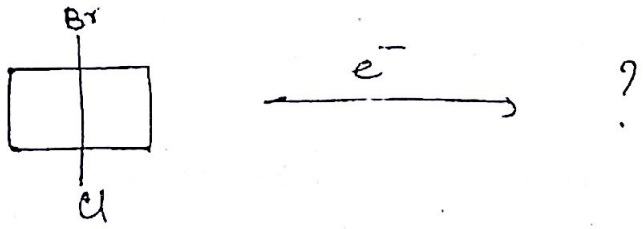
(iv) How will you convert $CH_3\ CH_2\ CH_2\ CHO$ to $CH_3\ CH_2\ CH_2\ CO\ CH_2\ C_6H_5$? 4

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

(i) Complete the following transformation via protection-deprotection protocol: 4



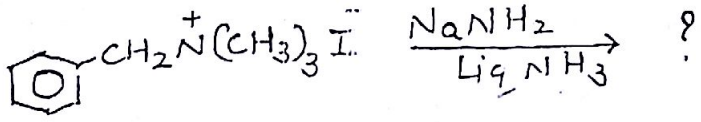
(ii) Give the product and mechanism of the following reaction : 4



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

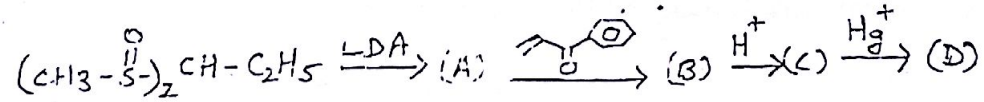
(i) Explain synthesis of olefins using phosphorous ylides. Discuss the mechanism and stereochemistry with suitable examples. 4

(ii) Complete the following reaction, name it and explain its mechanism: 4



(iii) Write a note on Barton-Kellogg olefination. 4

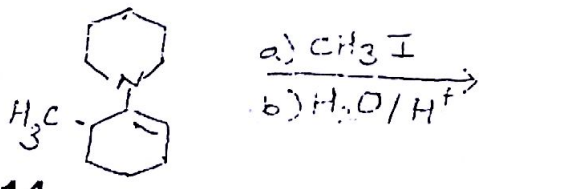
(iv) Complete the following reaction:— 4

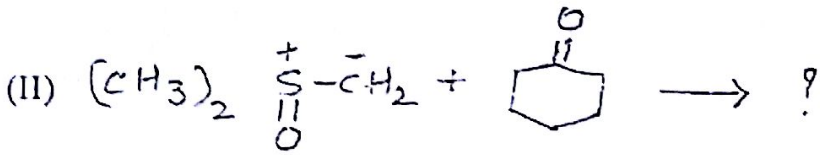


(b) Attempt any **one** of the following :—

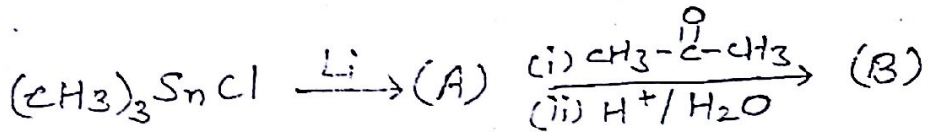
(i) Discuss briefly:- Steven's rearrangement. 4

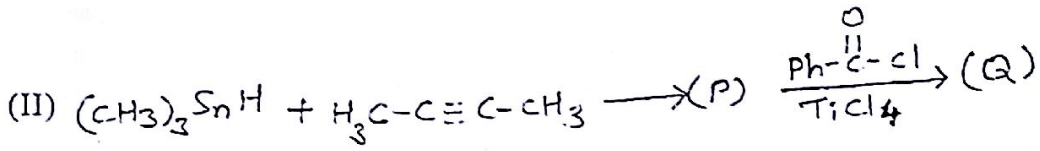
(ii) Complete the following reactions and give the structures of intermediates formed: 4

(I) 

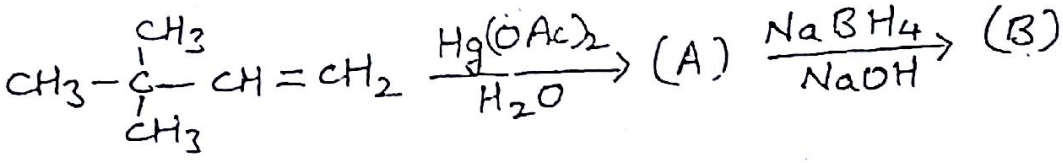
(II) 

4. (a) Attempt any **two** of the following :—
   (i) Give two methods of preparation and two applications of allyl silanes. 4
   (ii) Complete the following reactions: 4

(I) 

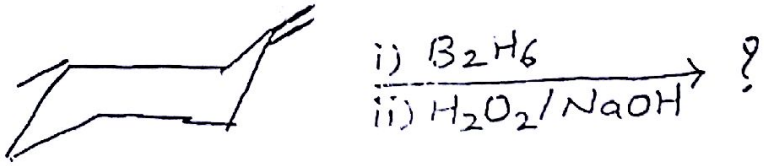
(II) 

(iii) Complete the following reaction, explain its mechanism and regioselectivity: 4



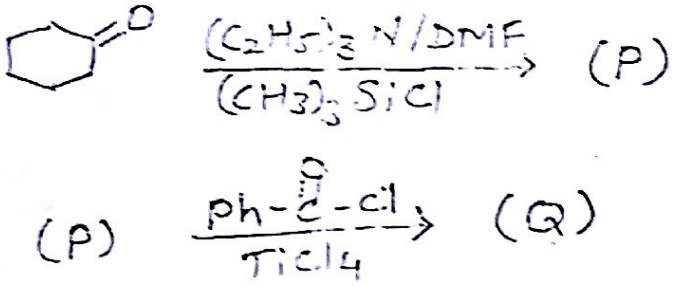
(iv) Give the following conversion through selenoxide compound: 4

(b) Attempt any **one** of the following :—
   (i) Complete the following reaction, explain its mechanism and stereochemistry: 4



(ii) Complete the following reactions :— 4

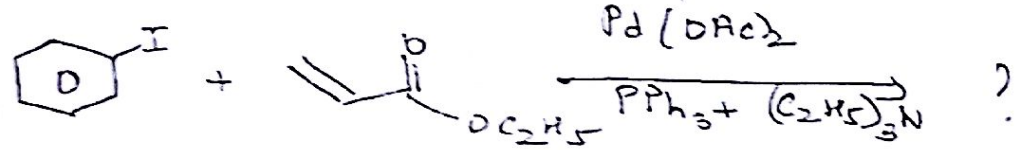
(I) 

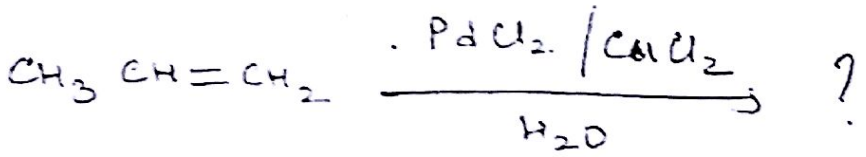
(II) 

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

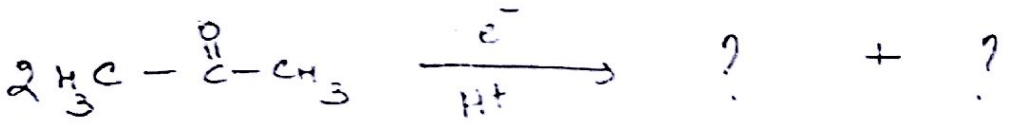
(a) Give the mechanism and one application of Passerini reaction. 3

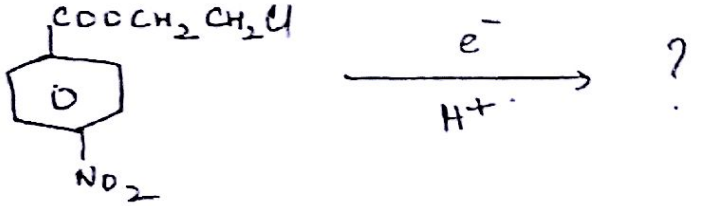
(b) Give the product and name of the following reactions: 3

(i) 

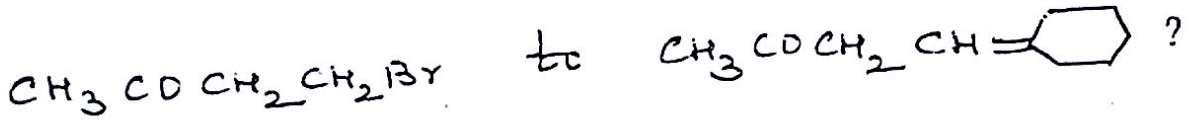
(ii) 

(c) Complete the following electrochemical reactions :— 3

(i) 

(ii) 

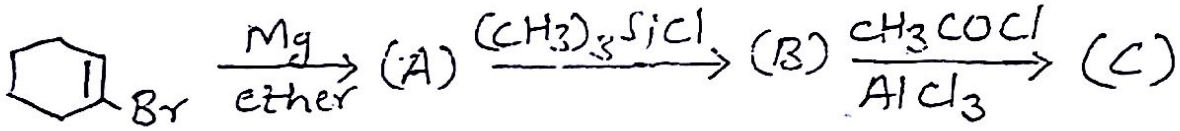
(d) Using the protection deprotection protocol how will you convert 3



(e) What are enamines? Give synthesis of an enamine using cyclohexanone and morpholine. 3

(f) What is nitrogen ylide? Give its structure and one method of preparation. 3

(g) Complete the following reaction :— 3



(h) (i) Give two methods of preparation of organotin compounds. 3

(ii) Complete the following reaction :—