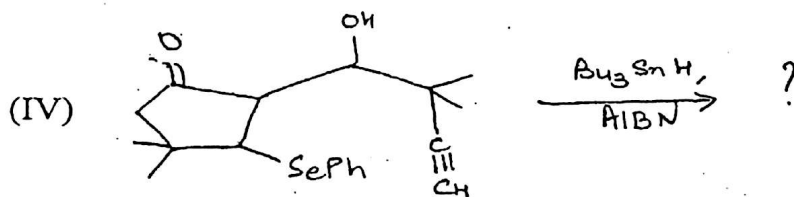
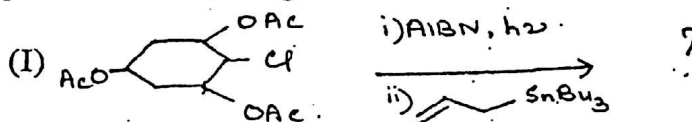


(2½ Hours)

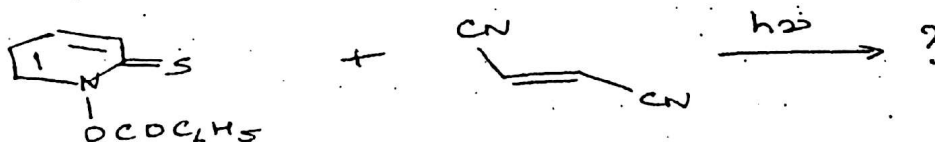
- N.B. : (1) All questions are compulsory.  
 (2) Figures to the right indicate full marks.

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

(i) Complete the following reactions :-

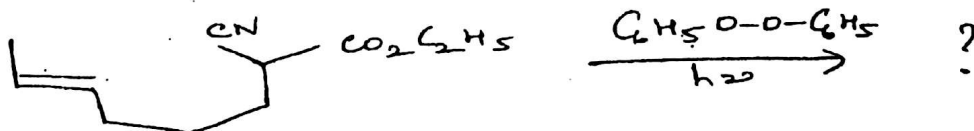


(ii) Give the product and mechanism of the following reaction.



(iii) Discuss the reaction of electrophilic and nucleophilic radicals on heteroaromatic compounds with suitable examples.

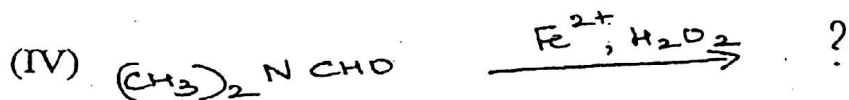
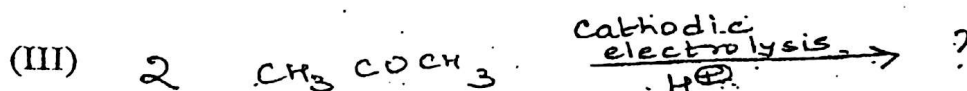
(iv) Complete the following reaction and give the mechanism.



(b) Attempt any one of the following :-

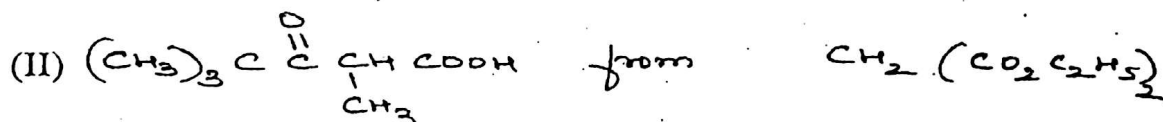
(i) Discuss with examples the generation of radicals by C-S bond cleavage.

(ii) Complete the following reactions and classify them as oxidative coupling / reductive coupling or dehydrodimerisation



(a) Attempt any two of the following :-

(i) How will you synthesise :-



(ii) Show all steps in the synthesis of camphoric acid from  $\text{H}_5\text{C}_2\text{OOCCH}_2\text{C}(\text{CH}_3)_2\text{CH}_2\text{CO}_2\text{C}_2\text{H}_5$

(iii) Discuss any two methods for synthesis of five membered rings with suitable examples.

(iv) Explain the following :-

- (I) Retrosynthetic analysis      (II) Divergent synthesis  
(III) Synthons                      (IV) Target molecule

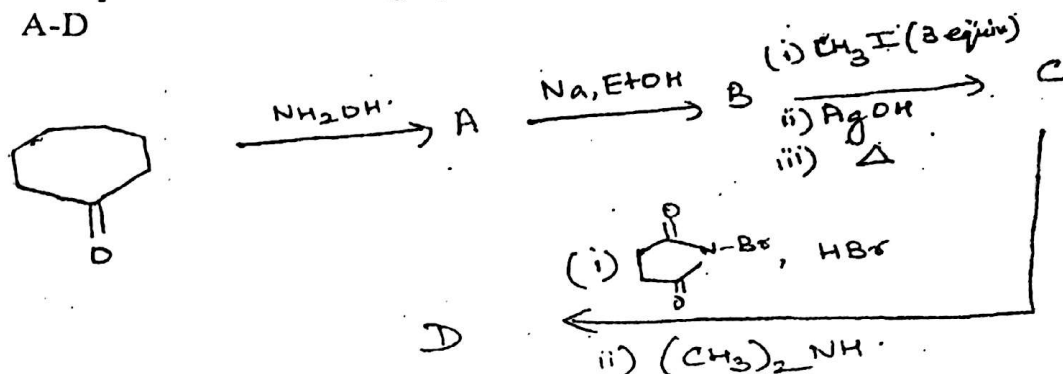
(b) Attempt any one of the following.

(i) Provide a retrosynthesis for the following :-



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- (ii) Complete the following synthesis by identifying the intermediates A-D



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

- What are crown ethers? Illustrate their selectivity towards alkali metal ions.
- Give structure of  $\alpha$ -cyclodextrins. Explain the role of cyclodextrin in selective chlorination of anisole using  $\text{HOCl}$ .
- Explain micelle formation and its applications in organic synthesis with suitable examples.
- Give four applications of polymer supported reagents with their advantages.

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- (b) Attempt any one of the following :-

- Write a brief account of 'ultrasound assisted organic reactions.'
- Discuss mechanism of reaction of benzyl chloride with  $\text{NaCN}$  in presence of quaternary ammonium salt.

4

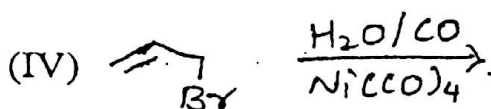
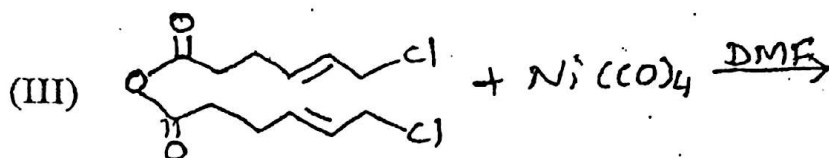
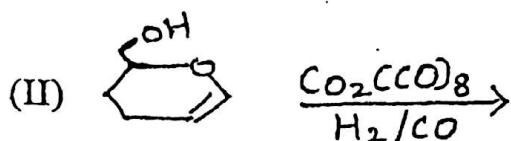
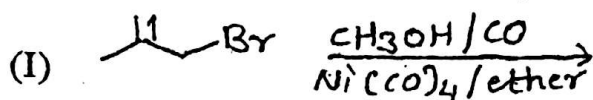
4. (a) Attempt any two of the following :-

- Illustrate with one example each, use of  $\text{Yb}(\text{OTf})_3$  as water tolerant Lewis acid catalyst in
  - Michael addition
  - Friedel Crafts reaction
  - Diels Alder reaction
  - Aldol condensation
- Explain the following with two examples each-
  - Oxidative addition
  - Migratory insertion

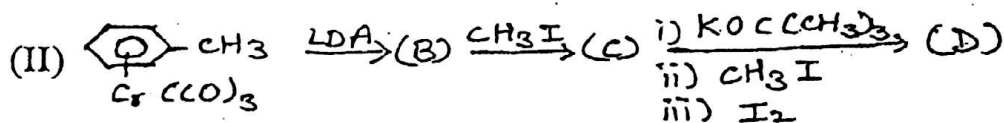
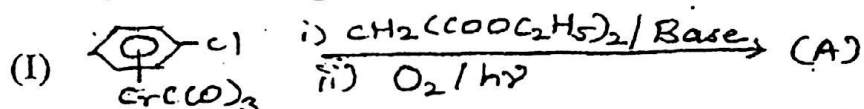
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(iii) Complete the following reactions :-

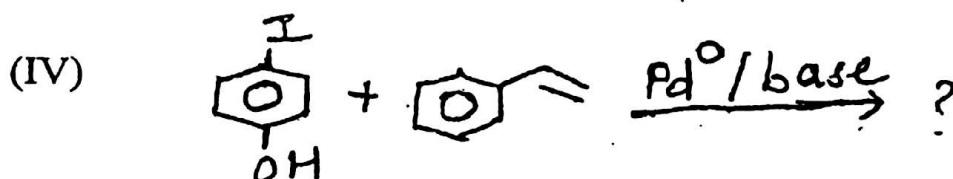
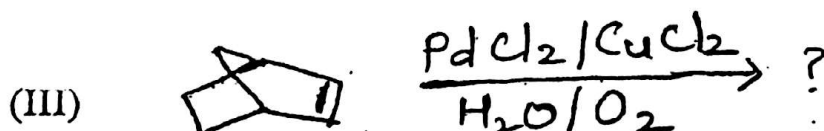
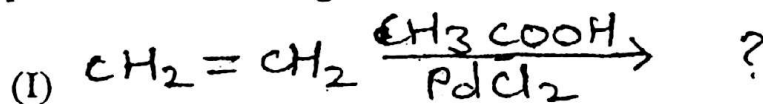


(iv) Complete the following reactions :-



(b) Attempt any one of the following :-

- (i) Give conversion of 1,3-cyclohexadiene into 5-methoxy - 1,2-cyclohexadiene using iron carbonyl
- (ii) Complete the following reactions-

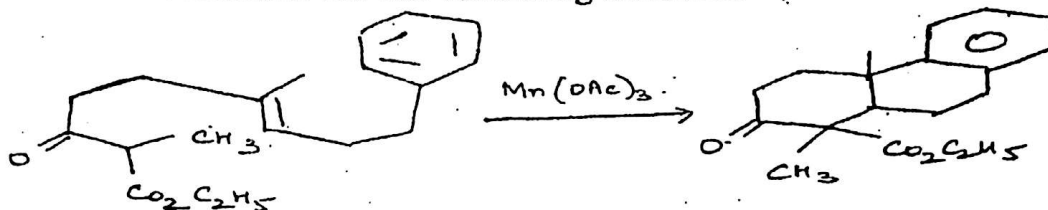


5. Attempt any four of the following :-

(a) Answer the following :-

- (i) How will you synthesise  $C_6H_5CH_2Br$  by the Hunsdiecker reaction ?
- (ii) Give an example of autooxidation
- (iii) Give the product obtained on irradiating a mixture of  $CHCl_3$  and  $CH_2 = CH - CN$  in the presence of peroxide

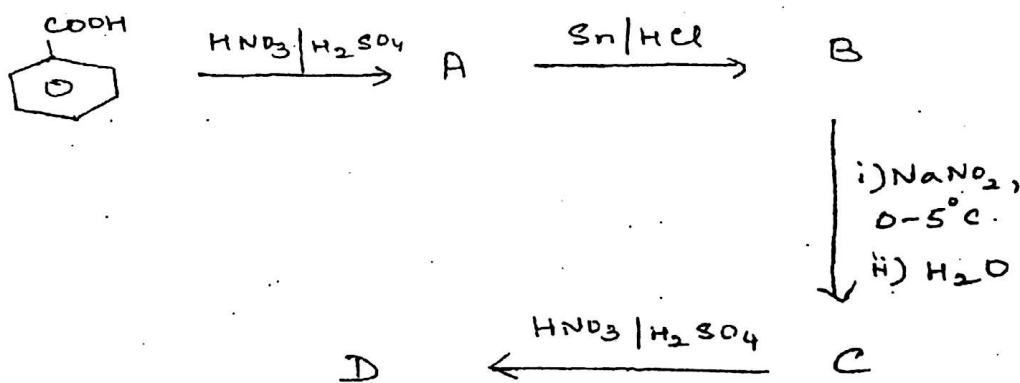
(b) Give the mechanism for the following reaction.



(c) How will you convert



(d) Complete the following reaction sequence by identifying the intermediates A - D



(e) What are cryptands ? Give their two applications in organic synthesis

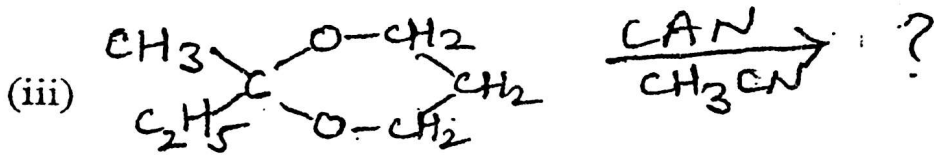
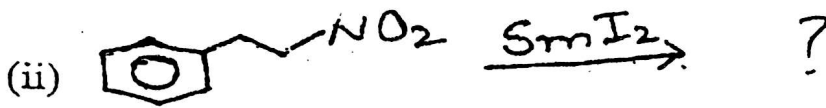
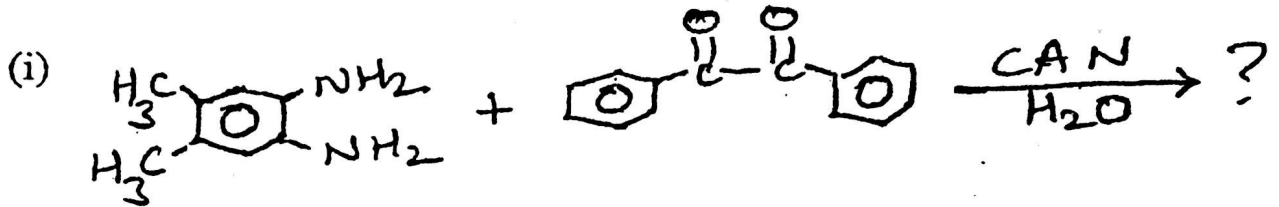
(f) Give an account of clay - catalysed reactions

(g) Complete the following reaction and explain the mechanism involved :-



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(h) Complete the following reactions :-



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