

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

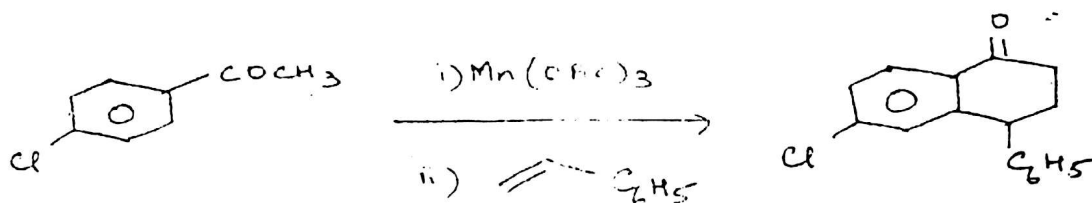
1. (a) Attempt any two of the following :-

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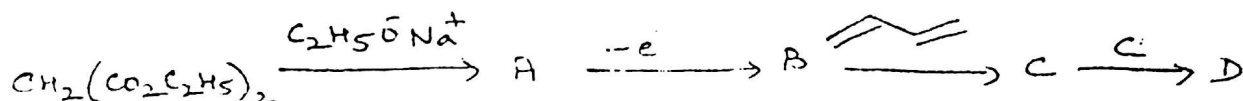
- (i) Explain electrophilic and nucleophilic radicals. State whether the following radical reaction will take place readily. Give reasons for your answer :-



- (ii) Give the mechanism for the following reaction :-



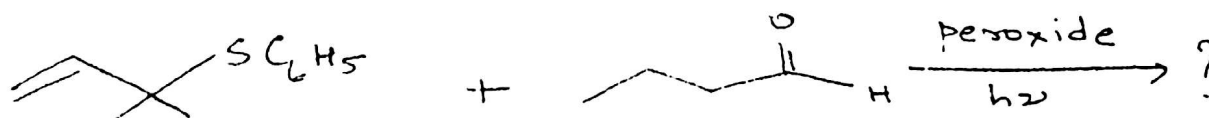
- (iii) Discuss with examples the generation of radicals by cleavage of C-Co bond.
 (iv) Complete the following reaction by identifying A, B, C and D :-



(b) Answer any one of the following :-

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- (i) Discuss with examples radical mediated carbon-carbon bond formation in aromatic compounds.
 (ii) Give the product and mechanism of the following reaction :-



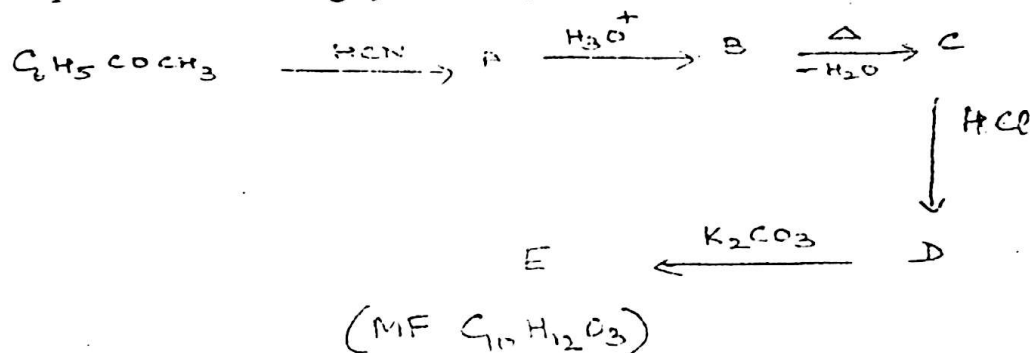
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2. (a) Attempt any two of the following :-

- Provide a retrosynthesis for caprolin.
- Discuss two methods for the synthesis of five membered rings with examples.
- Define 'Target Molecule'. Suggest synthesis of :-

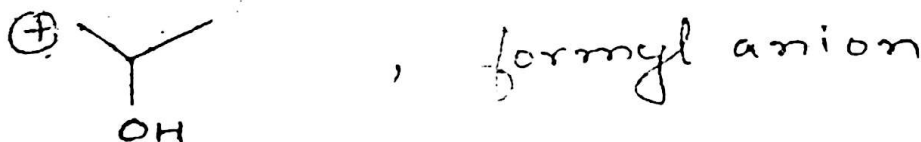


(iv) Complete the following synthesis by identifying A-E :-

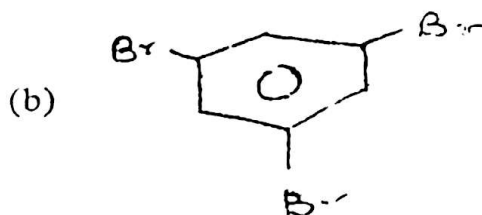


(b) Answer any one of the following :-

- Explain convergent synthesis. What are synthons? Give the synthetic equivalents for the following :-



(ii) Provide a retrosynthesis for the following :-



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

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- (i) What are cyclodextrins ? Discuss selective chlorination of anisole by HOCl using cyclodextrin.
- (ii) What are zeolites ? Give brief account of zeolites as catalyst in organic reactions.
- (iii) Write a note on polymer supported reagents.
- (iv) Explain the principles involved in micro wave induced reactions. Give two examples of microwave assisted reactions.

(b) Attempt any one of the following :-

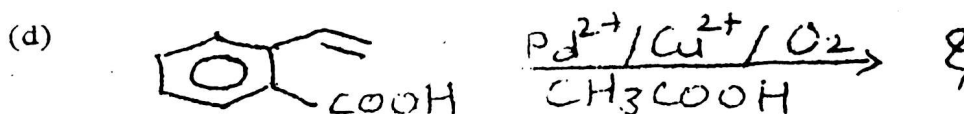
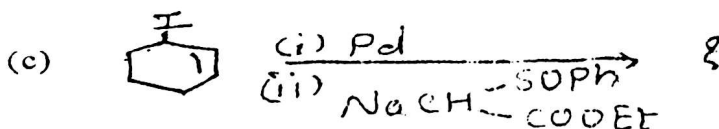
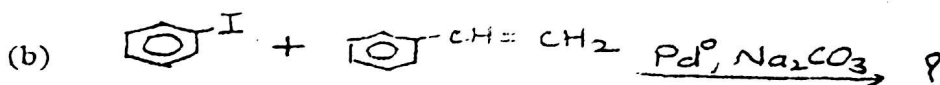
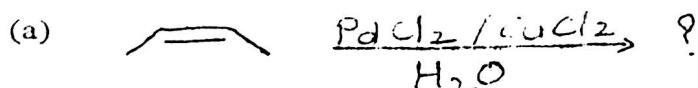
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- (i) What are cryptands ? Discuss their applications in organic synthesis.
- (ii) Write applications of clay as catalyst.

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

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(i) Complete the following reactions :-



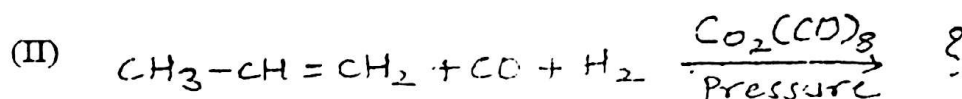
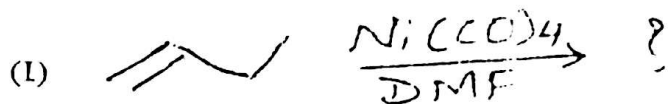
(ii) What is the action of Sml_2 on the following compounds ? :-

- (a) Alkyl halides
- (b) α -functionalised carbonyl compounds
- (c) Nitro compounds
- (d) Aldehydes.

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(iii) (a) Complete the following reactions :-



(b) Give conversion of 1, 3-cyclohexadiene to 5-cyano - 1, 2-cyclohexadiene using iron carbonyl.

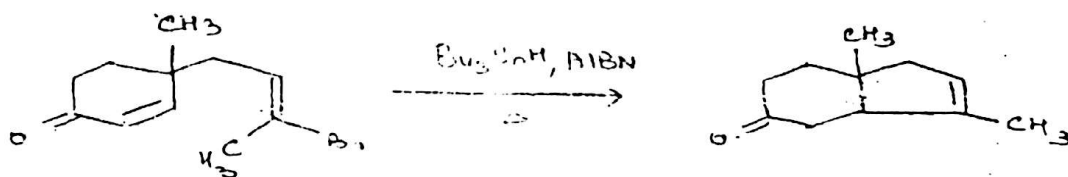
(iv) Write a brief note on oxidative addition and reductive elimination.

(b) Attempt any one of the following :-

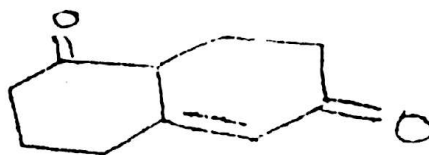
- (i) Explain migratory insertion with two suitable examples. 4
- (ii) Give one example each for the following reactions with $\text{Sc}(\text{OTf})_3$ as catalyst :-
- Aldol condensation
 - Friedel-Crafts' reaction
 - Diels-Alder reaction
 - Michael reaction.

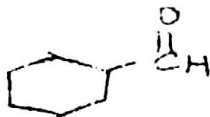

5. Attempt any four of the following :-

- (i) Give an example of :- 3
- Hunsdiecker reaction
 - Autooxidation
 - Oxidative coupling.
- (ii) Provide a mechanism for the following reaction :- 3



(iii) Provide a retroanalysis of the following molecule to identify the starting synthetic equivalent :- 3



(iv) Suggest synthesis of  from  3

(v) Explain the following reaction in presence of quaternary ammonium salt:- 3



(vi) What are micelles? Discuss with examples micelle catalysed reactions. 3

(vii) Give the product and mechanism of the following reaction :- 3



(viii) Give applications of cerium (IV) compounds :- 3

- (a) In synthesis of quinoxaline derivatives
- (b) as deprotecting agent.
