

**CHE-552****Synthetic Organic Chemistry**

M.Sc. CHEMISTRY (MSCCH-12/13/16/17)

Second Year, Examination-2019

**Time: 3 Hours****Max. Marks : 80**

Note : This paper is of eighty (80) marks containing three (03) Sections A,B and C. Attempt the questions contained in these sections according to the detailed instructions given there in.

**Section-A****(Long Answer Type questions)**

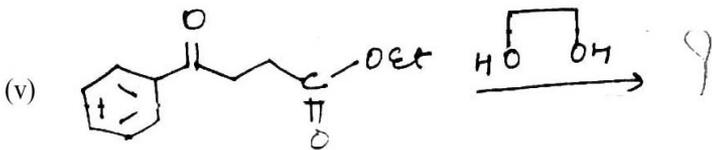
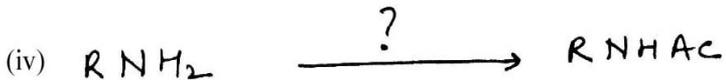
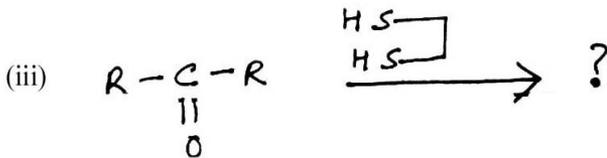
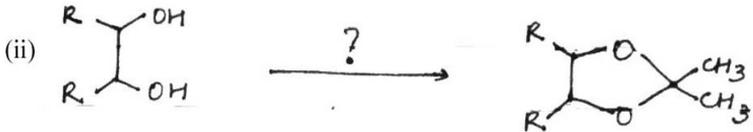
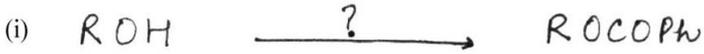
Note : Section 'A' contains four (04) long answer type questions of nineteen (19) marks each. Learners are required to answer two (02) questions only.

1 (a). Write note on protection and deprotection of following functional groups by various reagents in organic synthesis.

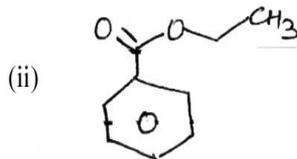
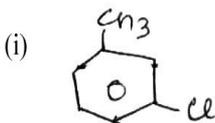
(i) Amines

(ii) Aldehydes and Ketones

(b) Complete the following reactions and give suitable reagents wherever require



2 (a) While retrosynthesis of following compounds



(b) Write explanatory notes on followings

(i) Two group C-X disconnection

(ii) Reversal of polarity

(iii) Convergent Synthesis

3 (a) Write detailed notes on following

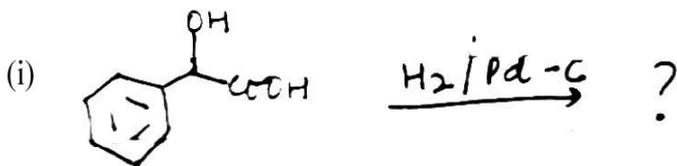
(i) Birch reduction

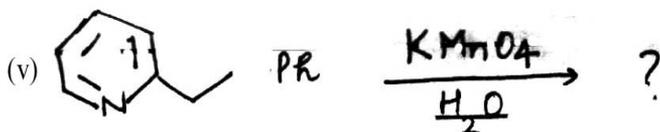
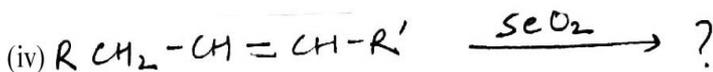
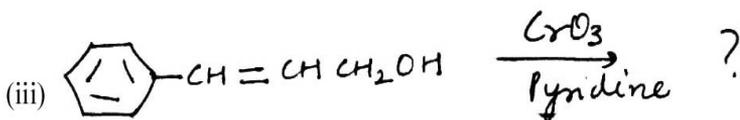
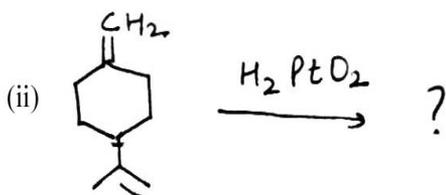
(ii) Na BH<sub>4</sub>

(iii) Clemmenson Reduction

(iv) A catalytic hydrogenation of alkenes.

(b) Complete the following reactions

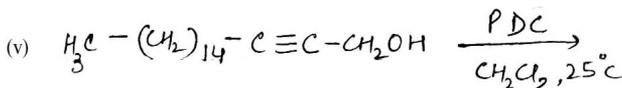
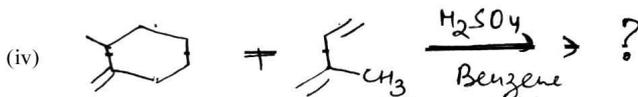
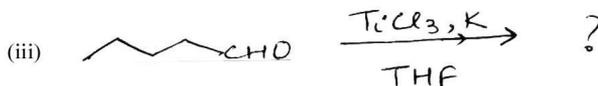
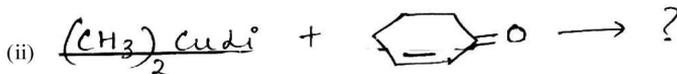
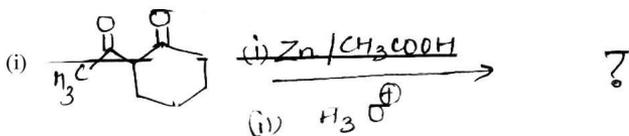




4 (a) Write notes on following

- (i) Grignard reagent
- (ii) Stork Enamine Synthesis
- (iii) Aldol condensation
- (iv) Robinson Annulation

(b) Complete the following reactions.



### Section-B

#### (Short Answer Type Questions)

Note: Section 'B' contains eight (08) short answer type questions of eight (08) marks each. Learners are required to answer four (04) questions only.

1. Write short notes on following

- (i) Prevost hydroxylation  
a. PCC reagent.

2. Write explanatory notes on followings

- (i) Decarboxylation of  $\beta$ -lactones  
(ii) Chugaw reaction

3. Define following terms.

- (i) Target molecule  
(ii) Disconnection approach

- (iii) Transform
- (iv) Synthons
- 4. How order of events and Regioselectivity is used in organic synthesis.
- 5. Discuss the following terms
  - (i) Enantiotropic ligands and site-selective ligands.
  - (ii) Stereo specificity in organic synthesis.
- 6. Write note on followings:
  - (i) Felkin-Anh Model in asymmetric synthesis.
  - (ii) Asymmetric Diels-Alder reaction.
- 7. Explain the followings:
  - (i) Oxidative cleavage of alkenes and diols.
  - (ii) Hydrogenation of nitriles and oxime.
- 8. Write synthetic applications of organoboranes in organic synthesis.

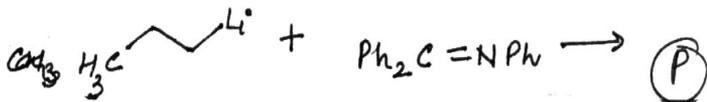
### **Section-C**

#### **(Objective Type Questions)**

Note: Section 'C' contains ten (10) objective type questions of one (01) mark each. All the questions of this section are compulsory.

- 1. Sulphur ylide and oxalyl chloride are involved in:
  - (a) Swern oxidation
  - (b) Jones reagent

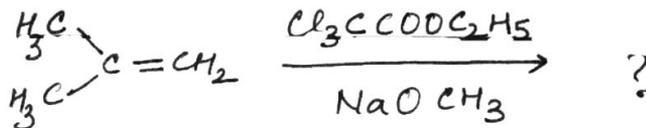
- (c) oppenauer oxidation
- (d) DMF reagent
2. Reductions of lactams with LAH gives
- (a) cyclic amines
- (b) cyclic alcohols
- (c) cyclic amides
- (d) ketones
3. Cyclopropanes are obtained from reaction of alkene with  $\text{CH}_2\text{I}_2$  and Zn in presence of Cu. This reaction is known as:
- (a) Simmon Smith reaction
- (b) Williamson synthesis
- (c) Shapiro reaction
- (d) Robinson Annulation
4. Reduction of alkynes with metal and liquid ammonia gives:
- (a) E-alkenes
- (b) Z-alkenes
- (c) Aldehydes
- (d) Amines
5. Draw structure of Product P



6 Complete the following reaction



7. Complete the following reaction:



8. Two germinal hydrogens of L-carbon of propionic acid are:

- (a) Enantiotopic ligands
- (b) Diastereotopic ligands
- (c) Enantiomers
- (d) Diastereomers

9. Full form of DCC dehydrating agent is .....

Fill in the blank :

10 In \_\_\_\_\_ hydrogenation catalyst is insoluble in solvent.

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