Seat No. : _____

XZ-111

April-2013

M.Sc. Sem.-IV

508 - CHEMISTRY (Organic)

(Adv. Organic Synthesis)

Time : 3 Hours] **[Max. Marks : 70**

Instructions : (1) **All** questions carry equal marks.
(2) **All** questions are compulsory.

1. Answer the following :

(A) Discuss the protection and de-protection of the following functional groups. **7**

(i) Mono alcohols, 1, 2 and 1, 3-diols.

(ii) Carboxylic acid.

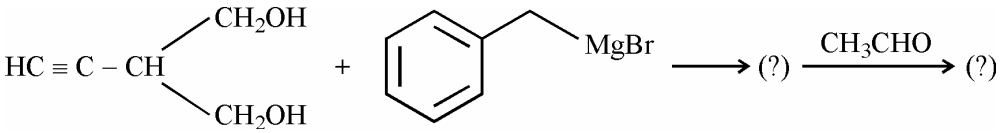
OR

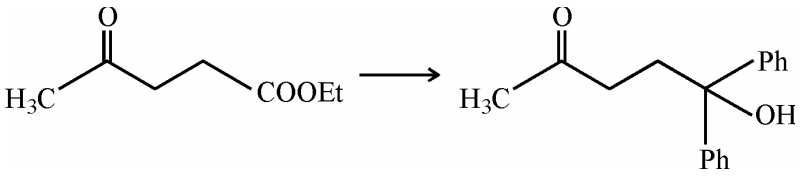
Discuss the protection and de-protection of the following functional groups.

(i) Amines

(ii) Carbonyl compounds

(B) Showing the use of a protecting group how will you carry out the following transformation ? **7**

(i) 

(ii) 

(iii) $CH_3NHCH_2CH_2Br \longrightarrow CH_3NHCH_2CH_2\overset{\displaystyle CH_3}{\underset{\displaystyle CH_3}{\overset{|}{\underset{|}{C}}}} - OH$

(Via Grignard reaction)

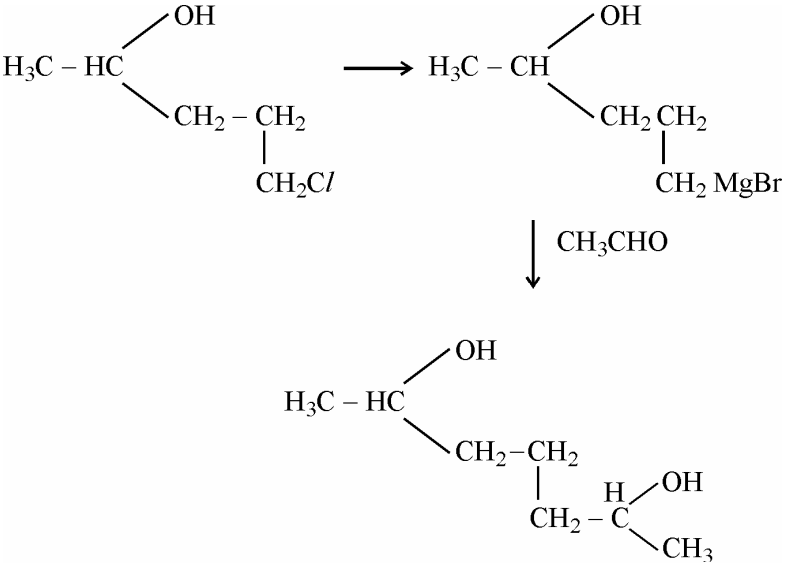
OR

Showing the use of a protecting group how will you carry out the following transformation ?

(i) $CH_3COCH_2CH_2CHO \xrightarrow{HCN} CH_3C(OH)(CN)CH_2CH_2CHO$

(ii) $H_2NCH_2CH_2CH_2OH \xrightarrow[\text{Pyridine}]{CH_3COCl} H_2NCH_2CH_2CH_2OCOCH_2$

(iii)



2. Answer the following :

(A) Define the following terms : **4**

(i) Synthon

(ii) Retro-synthesis

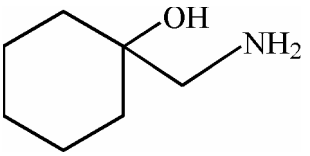
(iii) FGI

(iv) Disconnection

OR

Do the disconnection and give the synthesis for the following molecules :

(i)



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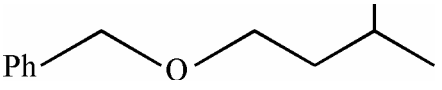
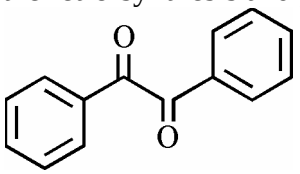
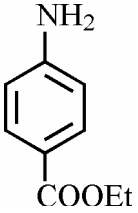
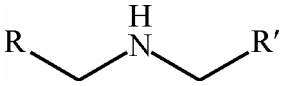
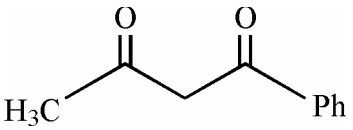


(B) Give the retro-synthesis and plan of synthesis. **10**

(i) 

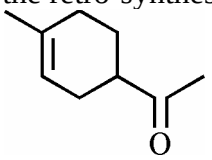
(ii) 

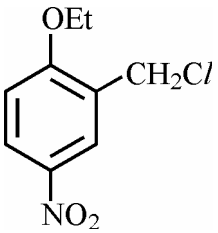
(iii) 

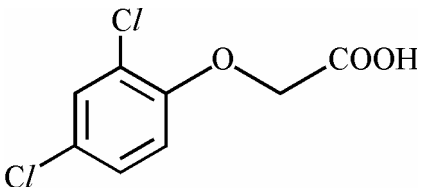
(iv) 

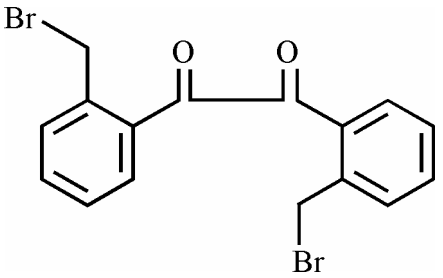
OR

Give the retro-synthesis and Plan of synthesis.

(i) 

(ii) 

(iii) 

(iv) 

3. Answer the following :

(A) (1) Define and discuss regioselectivity in organic synthesis. **6**

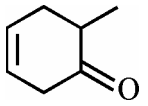
(2) Discuss the role of aliphatic nitro compounds in retro-synthesis.

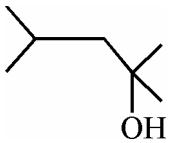
OR

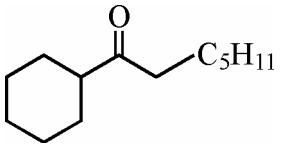
(1) Discuss the use of acetylenes in organic synthesis.

(2) Discuss regioselectivity in Wittig or Michael reaction.

(B) Outline retro-synthesis & plan the synthesis for the following molecules. **8**

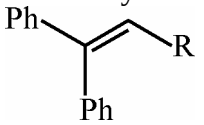
(i) 

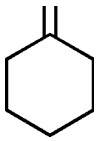
(ii) 

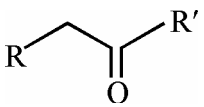
(iii) 

OR

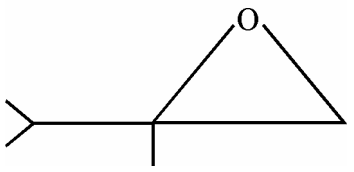
Outline retro-synthesis & plan the synthesis for the following molecules.

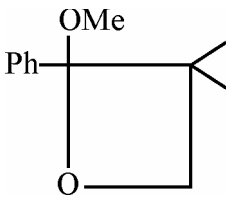
(i) 

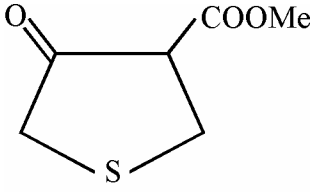
(ii) 

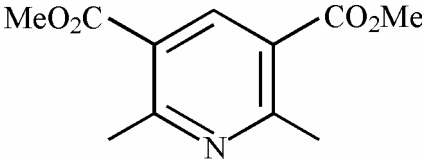
(iii) 

4. (A) Do the disconnections and Plan the synthesis for the following molecules. (any **three**) **8**

(i) 

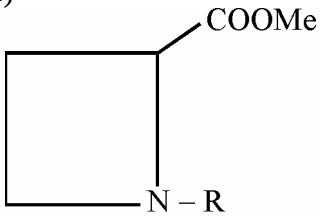
(ii) 

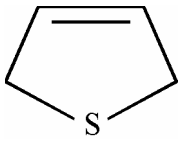
(iii) 

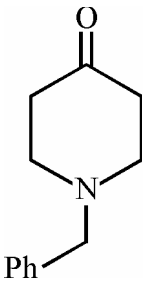
(iv) 

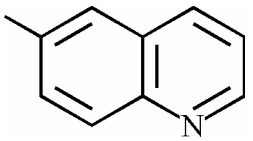
OR

Do the disconnections and plan the synthesis for the following molecules (any **three**)

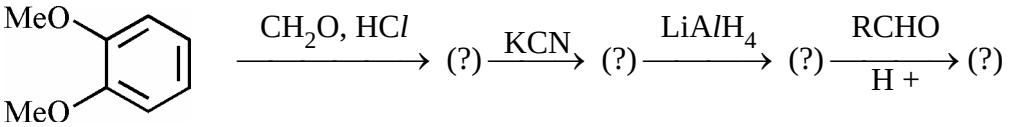
(i) 

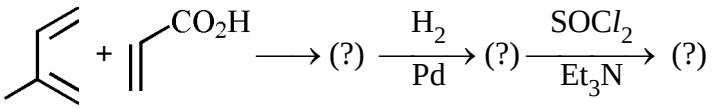
(ii) 

(iii) 

(iv) 

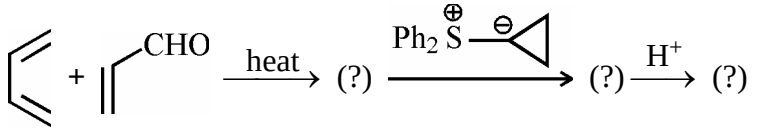
(B) Complete the following synthetic steps : **6**

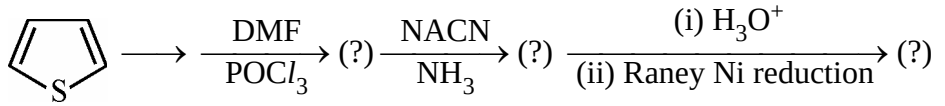
(i) 

(ii) 

OR

Complete the following synthetic steps.

(i) 

(ii) 

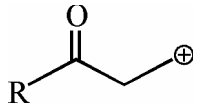
5. Answer the following questions : **14**

(1) What is protecting group ?

(2) What is chemo selectivity ?

(3) Give synthetic equivalent for the following synthons.

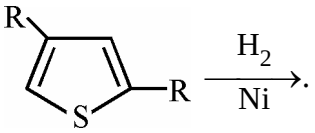
(i) $R^{\ominus}$

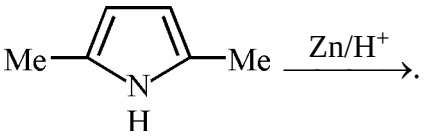
(ii) 

(4) Give one use of FMOC and THP.

(5) Write name of BOC and CBZ protecting group.

(6) Give one use of Trityl group.

(7) 

(8) 

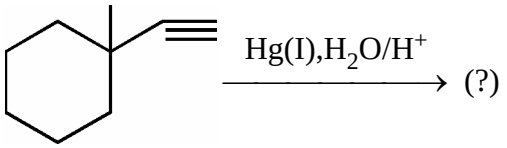
(9) Explain the use of enamines in organic synthesis.

(10) Give two examples of Illogical electrophile.

(11) With suitable example show one group C-C disconnection in carbonyl compounds.

(12) Direct hydrolysis of furan to 1, 4-diketones is not advisable, why ?

(13) Complete the following :



(14) Give synthetic equivalents for the given synthons :