Seat No. : _____

ZC-115

April-2014

M.Sc., Sem.-IV

CHE (O) 508 : Organic Chemistry

(Advanced Organic Synthesis)

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

Instructions : (1) **All** questions are compulsory.

(2) Figures to right indicate full marks.

1. Answer the following :

(A) Discuss the protection and deprotection of the following functional groups : **7**

(i) Amines

(ii) Alcohols

OR

Discuss the protection and deprotection of the following functional groups.

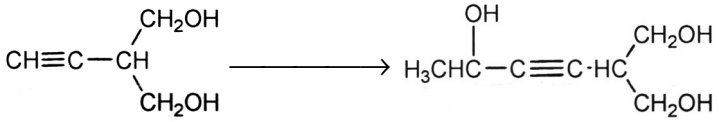
(i) Carboxylic acid

(ii) Aldehyde and ketone

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

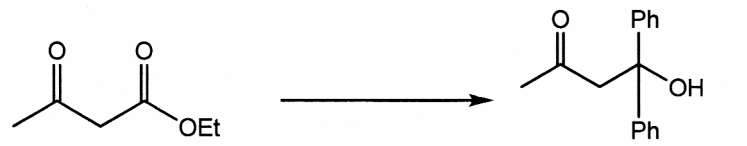
(i) $BrCH_2CH_2CH_2CHO \longrightarrow CH_3OCH_2CH_2CH_2CHO$

(ii) $NH_2CH_2CH_2CH_2OH \xrightarrow{CH_3COCl/Pyridine} NH_2CH_2CH_2CH_2OCOCH_3$

(iii) 

OR

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

(i) 

(ii) $CH_3C(=O)-CH_2CH_2CHO \xrightarrow{NaBH_4} CH_3CH(OH)CH_2CH_2CHO$

(iii) $BrCH_2COCH_3 \longrightarrow PhCH_2CHOHCH_2COCH_3$

(via Grignard reaction using $PhCH_2CHO$)

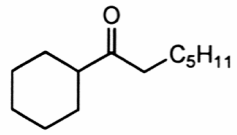
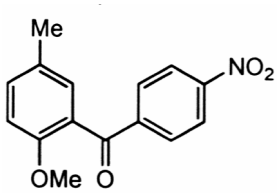
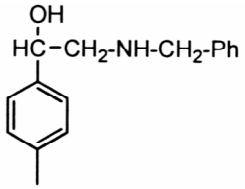
2. Answer the following :

(A) What is meant by retrosynthetic analysis ? Giving example define the terms : Target molecule & synthetic equivalent. **7**

OR

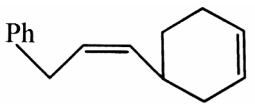
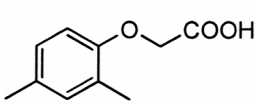
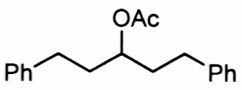
What is Chemoselectivity ? Discuss the use of any three compounds as umpolung reagent.

(B) Do the disconnections and give the synthesis for the following molecules : (Any **two**) **7**

(i)  (ii)  (iii) 

OR

Do the disconnections and give the synthesis for the following molecules : (Any **two**)

(i)  (ii)  (iii) 

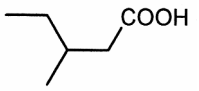
3. Answer the following :

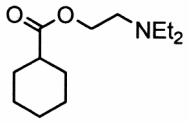
(A) Discuss the use of acetylenes and nitro compounds in organic synthesis **7**

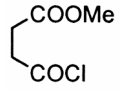
OR

Discuss the regioselectivity in witting and michael reaction.

(B) Do the disconnections and plan the synthesis for the following molecules : (Any **two**) **7**

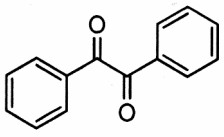
(i) 

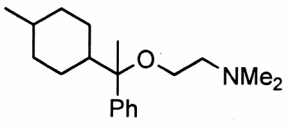
(ii) 

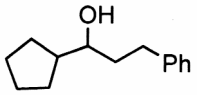
(iii) 

OR

Do the disconnections and plan the synthesis for the following molecules : (Any **two**)

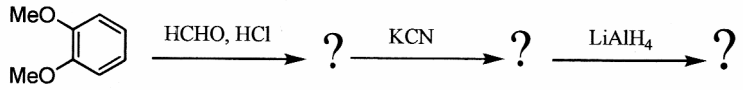
(i) 

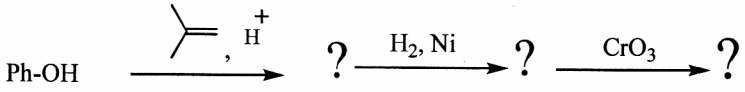
(ii) 

(iii) 

4. Answer the following :

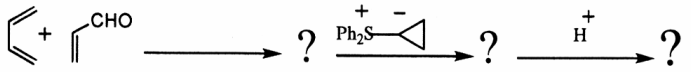
(A) Complete the following steps : **7**

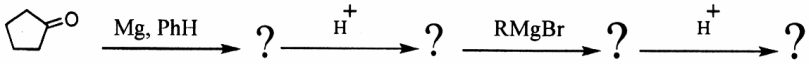
(i) 

(ii) 

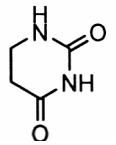
OR

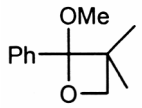
Complete the following steps :

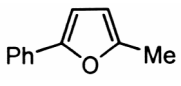
(i) 

(ii) 

(B) Do the disconnections and plan the synthesis for the following molecules : (Any **two**) **7**

(i) 

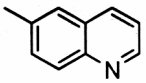
(ii) 

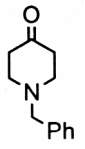
(iii) 

OR

Do the disconnections and plan the synthesis for the following molecules : (Any **two**)

(i) 

(ii) 

(iii) 

5. Answer the following : **14**

Define :

(i) Synthon.

(ii) Illogical electrophile.

(iii) FGI.

(iv) What are the needs of protective group in organic synthesis ?

(v) Why simple ethers are not used in the protection of group ?

(vi) What is one group C-C disconnection ?

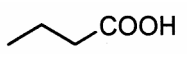
(vii) Write priority order based on reactivity of carbonyl group: R-COOH, R-CHO, R-COR', RCOOR'.

(viii) Write name of BOC & CBZ protecting group.

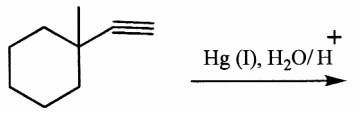
(ix) Give one use of trityl group.

(x) Give common FGI approach for ester group.

(xi) Give the use of grignard reagent in disconnection of following carboxylic acid :



(xii) Explain the use of enamine in organic synthesis.

(xiii) 

(xiv)