Seat No. : _____

AG-124

April-2015

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 the right indicate full marks.

1. Answer the following :

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

(i) Carboxylic acid

(ii) Mono alcohols, 1, 2 and 1,3-diols

OR

(A) Discuss the protection and de-protection of the following functional groups :

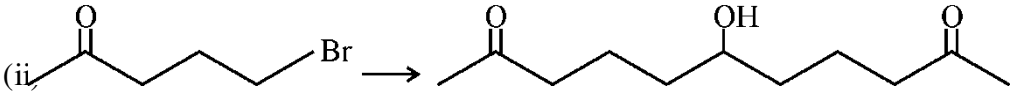
(i) Amines

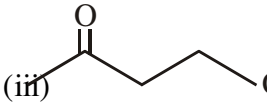
(ii) Aldehyde and Ketone

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

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

(Via Grignard reaction)

(ii) 

(iii) 

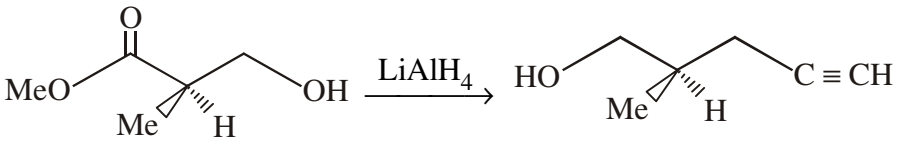
$\xrightarrow{HCN}$ $CH_3C(OH)\ (CN)\ CH_2CH_2CHO$

OR

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

(i) $BrCH_2CH_2CH_2CHO \longrightarrow CH_3OCH_2CH_2CH_2CHO$

(ii) $H_2NCH_2CH_2CH_2CHO \xrightarrow{KMnO_4} H_2NCH_2CH_2CH_2COOH$

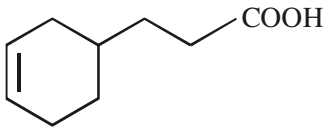
(iii) 

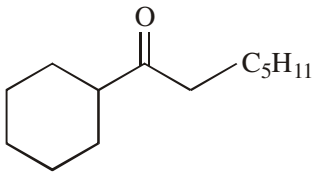
2. (A) What is reversal of polarity ? By giving illustration discuss the use of epoxides, 1,3-dithianes and alkynes as umpolung reagents. **7**

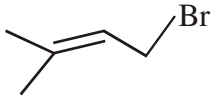
OR

What is Chemoselectivity ? What is meant by retrosynthetic analysis ? Giving examples define the term FGI and Synthon ?

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

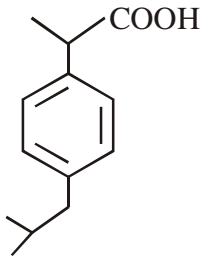
(i) 

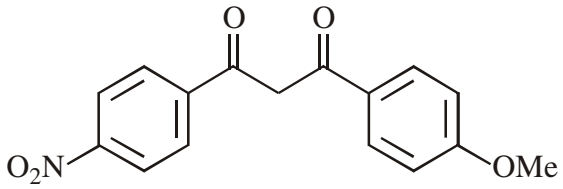
(ii) 

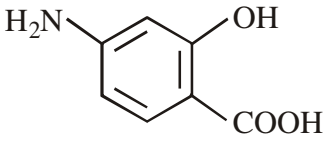
(iii) 

OR

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

(i) 

(ii) 

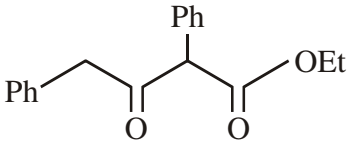
(iii) 

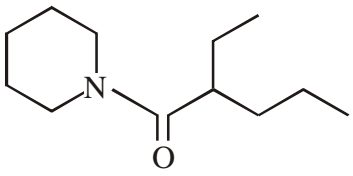
3. (A) Discuss regioselectivity in wittig or Michael reaction. **7**

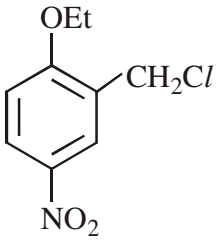
OR

Discuss the use of aliphatic nitro compounds and acetylenes in Organic Synthesis.

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

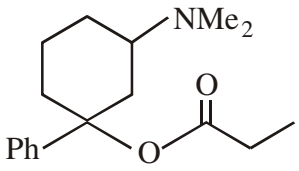
(i) 

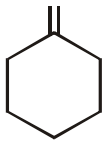
(ii) 

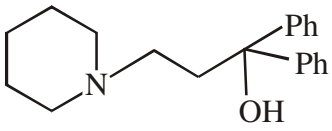
(iii) 

OR

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

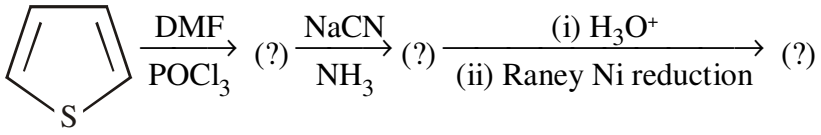
(i) 

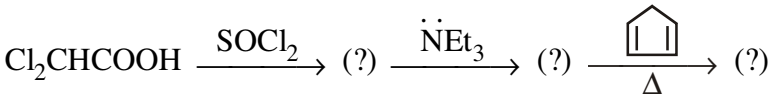
(ii) 

(iii) 

4. Answer the following :

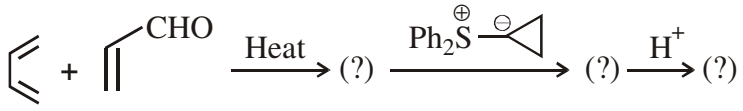
(A) Complete the following steps : **7**

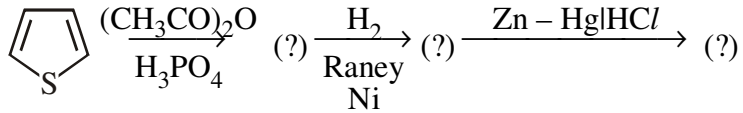
(i) 

(ii) 

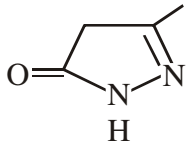
OR

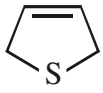
(A) Complete the following steps :

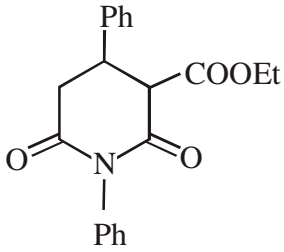
(i) 

(ii) 

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

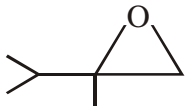
(i) 

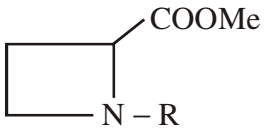
(ii) 

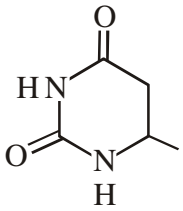
(iii) 

OR

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

(i) 

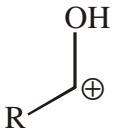
(ii) 

(iii) 

5. Answer the following : **14**

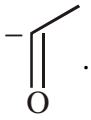
(1) Define Synthetic Equivalent.

(2) Define Illogical Electrophile.

(3) Give synthetic equivalent of  and ⊖ COOH.

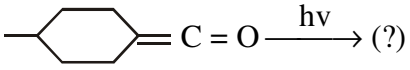
(4) Write name of TBDMS and FMOC protecting group.

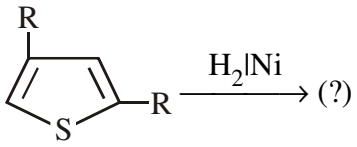
(5) What is one group C–C disconnection ?

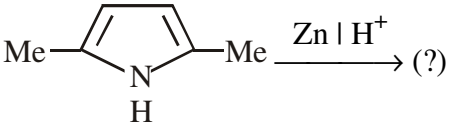
(6) Give synthetic equivalent of $\overset{\ominus}{N}H_2$ and  .

(7) Write name of t-BOC and CBZ protecting group.

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

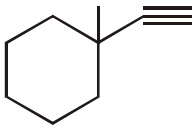
(9) 

(10) 

(11) 

(12)  $\xrightarrow[\text{(ii) Base}]{\text{(i) } RCH_2X}$ (?)

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

(14)  $\xrightarrow{Hg(I),\ H_2O|H^+}$ (?)