

**SARDAR PATEL UNIVERSITY**  
**M.Sc. Chemistry (Third Semester) Organic Chemistry Examination**  
**Wednesday, 20<sup>th</sup> November 2019**  
**Disconnection Approach (PS03CORC22)**

Time: 2:00 pm to 5:00 pm

Total marks: 70

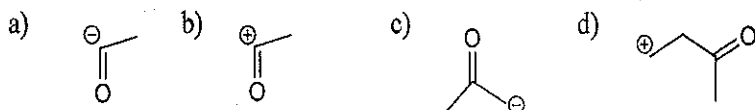
Note: (i) Figure to the right indicates Marks

(ii) Attempt all Questions

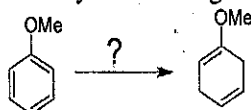
**Que: 1 Choose the correct answer from the following multiple choice of questions****[08]**(i) The synthetic equivalents of the synthon  $H^-$  is/are...

- a) HCl  
 b)  $(NH_4)X$   
 c)  $LiAlH_4$   
 d) All of these

(ii) Identify the illogical electrophile.

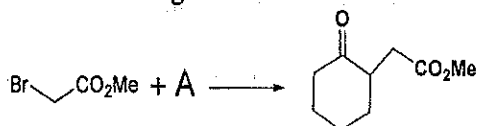


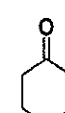
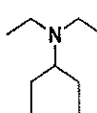
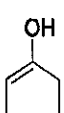
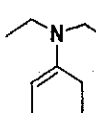
(iii) Identify correct reagent in the following conversion.



- a) Na-Liq. $NH_3$ /EtOH  
 b) Li-Liq. $NH_3$ /EtOH  
 c) Both a) and b)  
 d) HI/Heat

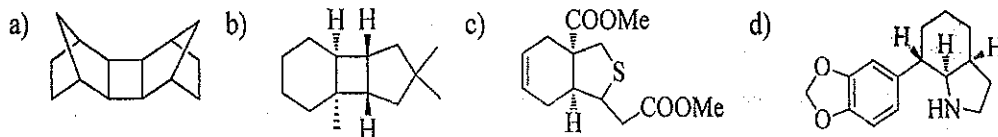
(iv) The best starting material A to be used for designing of TM below would be.



- a)  b)  c)  d) 

(v) When succinic anhydride reacts with benzene in presence of aluminum chloride then, which of the following compounds is produced?

- a) 1-phenylpentane-1,4-dione  
 b) 4-oxo-4-phenylbutanoic acid  
 c) Benzocyclohexanone  
 d) Acetic anhydride

(vi) Which of the following substrates was used by Corey for synthesis of  $\alpha$ -caryophyllene alcohol?

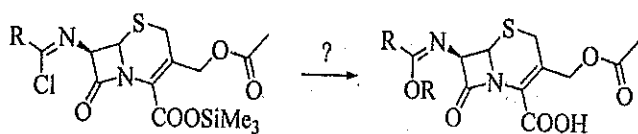
(vii) Which of the following is not a proper choice of reagent for protecting -OH group in chemoselectivity.

- a) Strong base as LDA  
 b) R-Mg-X and RLi  
 c) Diels-Alder reagents  
 d) Wittig reagents

(viii) Find the correct reagent for the below transformation.

①

(P.T.O.)

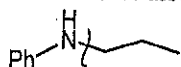


- a) ROH  
b) ROCl  
c) ROR  
d) ROCOOR

Que: 2 Answer the following (Any seven)

[14]

- Distinguish between the terms FGA and FGI in disconnection, giving suitable examples.
- What do you understand by 'disconnection'? List the criteria which describes a TM best to design.
- Describe disconnection and synthetic approaches to 1,6-dicarbonyl compound, taking a suitable example.
- State significance of pinacol-pinacolone reaction in design of organic synthesis.
- How will you carry out disconnection of epoxide and cyclopropane. Explain with suitable examples.
- Explain why the below C-N disconnection is not reliable.



- Give selective protection of *trans*-diequatorial 1,2-diols in carbohydrate systems with suitable examples.
- List the characteristic properties of 'Good' protecting groups.
- Write about protection of primary and secondary amines.

Que: 3 (a) List the reactions showing suitable reagents to achieve at least four different functional compounds from alcohol. Show the possible disconnection approaches to  $\text{PhCH}_2\text{CH}_2\text{OH}$ . Design its synthesis picking up the best approach.

[6]

(b) Give significance of the reactions given below in design of organic molecules.

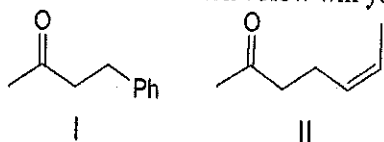
[6]

- Wittig reaction
- Michael reaction

OR

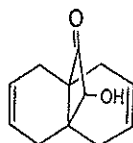
(b) State the term 'activation'. How will you design the TMs shown below.

[6]



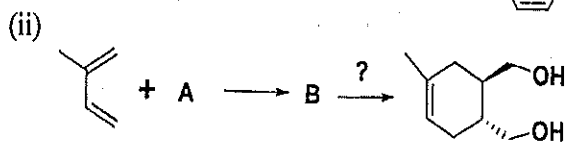
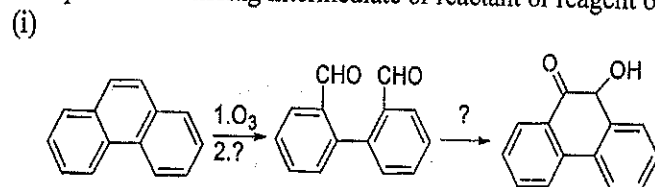
Que: 4 (a) What do you understand by the acyloin reaction? Give its mechanism, stating its significance in design of organic synthesis. Discuss disconnection and synthesis of a below TM.

[6]



(b) Complete with missing intermediate or reactant or reagent or condition.

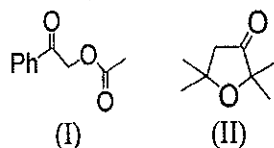
[6]



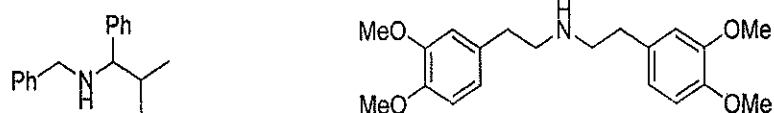
(2)

OR

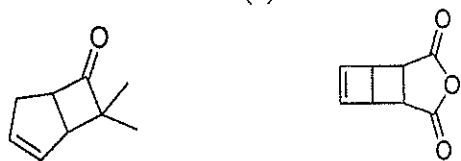
- (b) What do you mean by logical and illogical disconnections? State the illogical two-group disconnection. Design the synthesis of TMs shown below. [6]



- Que: 5 (a) Give retrosynthetic analysis of the following TMs and discuss their synthetic routes. [6]

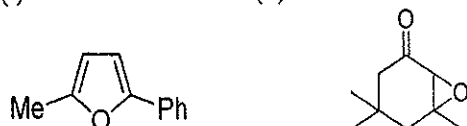


- (b) Give retrosynthetic analysis of the following TMs and discuss their synthetic routes. [6]

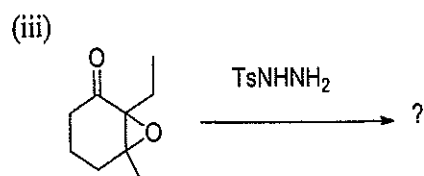
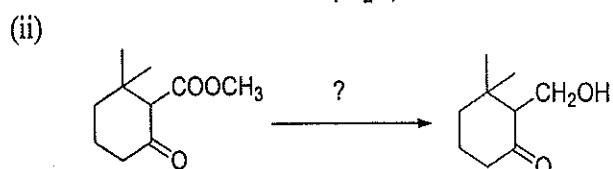
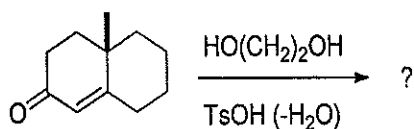


OR

- (b) Give retrosynthetic analysis of the following TMs and discuss their synthetic routes. [6]



- Que: 6 (a) Complete the following reactions and give their mechanism with evidences. [6]



- (b) What is Grob fragmentation reaction? Explain the following with suitable examples: [6]
- (i) Fragmentations are control by the stereochemistry.  
(ii) Ring expansion by the stereochemistry.

OR

- (b) How can you protect aldehyde selectively in presence of ketone? Write about the protection and deprotection of alcoholic group for the formation of tetrahydropyranylether. [6]

X  
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(5)

