

SEAT No. \_\_\_\_\_

No. of Printed Pages: 03

[51]

SARDAR PATEL UNIVERSITY  
M.Sc. (Organic Chemistry) Examination (CBCS) III<sup>rd</sup> Semester  
January-2021




Saturday, Date: 02.01.2021

Time: 10.00 a.m. to 12.00 noon, Paper: PS03CORC22

Subject: A disconnection approach, Max. Marks: 70

N.B.: i) Figures to the right indicate marks which are carried by each question

Q.1(a) Answer MCQs below choosing the correct option [08]

- i) EtMgBr is a best SE for the synthon \_\_\_\_
- a)  $\text{CH}_3\text{CH}_2^-$       b)  $\text{CH}_3^+$       c)  $\text{CH}_3^-$       d)  $\text{CH}_3\text{CH}_2^+$
- ii) Cyclic ketal formation is generally aimed at controlling the ....
- a) Aldehyde functionality      b) Ketone functionality  
c) Amide functionality      d) Acid functionality
- iii) Identify the illogical nucleophile
- a)       b)       c)       d)  $\text{Et}^+$
- iv) THP derivative is used for the protection of...
- a) Acid      b) Amide      c) Alcohol      d) Ketone
- v) Which of the following a condition is used for epimerization?
- a)  $\text{H}_2\text{O}_2/\text{Base}$       b)  $\text{NH}_2\text{OH}/\text{HCl}$       c)  $\text{NaOEt}/\text{EtOH}$       d) All
- vi) Ketene intermediate is part of the mechanism of ....
- a) Diels-Alder Reaction      b) Arndt-Eistert Reaction  
c) Perkin reaction      d) Dickmann reaction
- vii) Catalysts which promote acetalization of cyclohexanone and cleavage of 1,3-dioxolane are
- a) PPTS- $\text{BF}_3 \cdot \text{OEt}_2$ -TsOH and TsOH/ $\text{H}_2\text{O}$  respectively  
b) Amberlyst-15 and TsOH, $\text{H}_2\text{O}$  respectively  
c) Both a) and b)  
d) None
- viii) Which of the following is correct if InterMRs = Intermolecular reactions, and IntraMRs = intramolecular reactions?
- a) InterMRs are faster than IntraMRs.  
b) IntraMRs are faster than InterMRs  
c) Both IntraMRs and InterMRs proceed with same rate  
d) InterMRs or IntraMRs doesn't affect rate of the reaction

Q.1(b) Answer in single word or structure or line [16]

- i) Identify the correct product of the reaction between  $\text{CH}_2=\text{CH}-\text{CO}_2\text{Me}$  and  $\text{H}_2\text{S}$
- ii) Predict the product from the reaction between  $\text{R}-\text{CH}=\text{CH}_2$  and MCBA
- iii) Correct reactivity order of  $(\text{RCO})_2\text{O}$ ,  $\text{RCOCl}$ ,  $\text{RCO}_2\text{R}$ , and  $\text{RCONR}_2$  will be
- iv) What do you mean by FGI and FGA?
- v) Wittig reaction is used for the preparation of olefins! True or False?
- vi) Name the reagent to reduce triple bond into double bond
- vii) Name the reagents for reduction of oxime

[13]

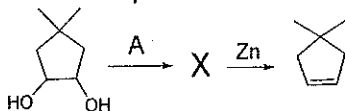
(P.T.O.)

- viii) Mannich reaction product is a best source of  $\alpha, \beta$ -unsaturated carbonyl compound! True or False?
- ix) Name the reaction known to produce  $\alpha, \beta$ -epoxy ester from cyclohexanone and an  $\alpha$ -halo-ester
- x) Acylation of  $\text{PhNH}_2$  doesn't go twice in the same way as alkylation goes! Explain
- xi) Suggest the suitable reagent(s) to cleave benzylether
- xii) The N-H proton(s) in primary and secondary amines needs to be protected especially when it is exposed to the reagent \_\_\_\_\_
- xiii) The C-O and O-H bonds are easy to break with hard nucleophiles! Why?
- xiv) Pinacol synthesis is useful to afford 1,3-diCO systems! True or False?
- xv) Trimethylsilyl chloride is a reagent used to protect ketone! True or False?
- xvi) MEM derivative is used for the protection of Phenol! True or False?

**Q.2** Answer in brief, *any seven*

[14]

- i) Illustrate the term 'activation' giving suitable example
- ii) Show how the disconnection 1,4-DiCO leads to Michael accepter and donor as starting materials
- iii) Identify the reagent A and the compound X in the following conversion

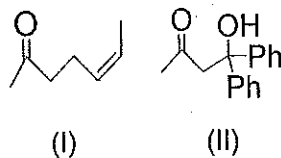


- iv) Provide good synthons for aminoacid with suitable example
- v) Give retro synthetic analysis and suggested route for N-propylaniline.
- vi) Give examples of logical and illogical electrophiles and neucleophiles
- vii) Arrange TMS, TBDPS, TIPS, TES, and TBDMS in increasing order of their strengths to ease the cleavage of silylether linkage in acidic medium
- viii) State fragmentation reaction for the polarization of C-C bond giving a suitable example
- ix) Acetyl chloride is a SE used for the synthone \_\_\_\_\_

**Q.3** Answer the following

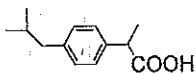
[08]

- a) What are acetal and ketal? State their formation with suitable examples.
- b) Design the synthesis of TMs below



OR

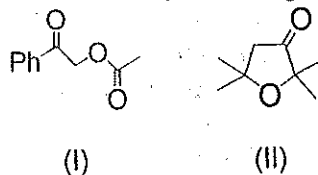
**Q.3** Give strategy to disconnect acid  $\text{RCOOH}$ . Design synthesis of TM below



**Q.4** Answer the following

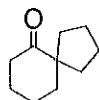
[08]

- a) State illogical two-group disconnection, and design synthesis of TMs below



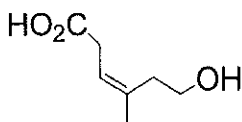
[2]

- b) State the synthesis of 1,2-diol. Disconnect and plan synthesis of TM below



OR

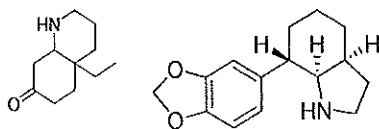
- Q.4 Show the strategy to disconnect 1,6-dicarbonyl system. Plan the synthesis of TM below, showing its disconnection



- Q.5 Answer the following

[08]

- a) Show disconnection and synthesis design of TMs below



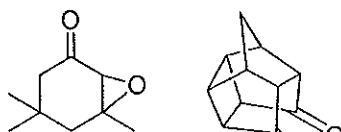
(I)

(II)

- b) Give any three special methods of disconnection for three member ring.

OR

- Q.5 State disconnection approaches to TMs below and design them with suggested synthesis routes



(I)

(II)

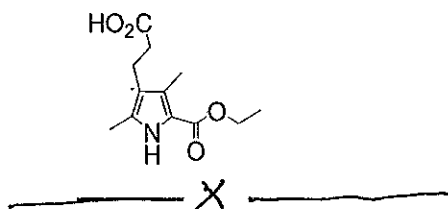
- Q.6 Answer the following

[08]

- a) Provide the different protecting and deprotecting reagents for aldehydes and ketones in terms of *S,S*-acetals  
 b) Give the examples of fragmentation reactions, which are controlled by stereochemistry

OR

- Q.6 Disconnect and design synthesis of Mesoporphyrin IX precursor shown below



[3]

