

[53]

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

No of Printed Pages: 04

**SARDAR PATEL UNIVERSITY**

M.Sc. Semester - III (Organic Chemistry) Examination

Friday, 22<sup>nd</sup> March 2019

PS03CORC02: Organic Synthesis - A disconnection Approach

Time: 02:00 pm to 05:00 pm

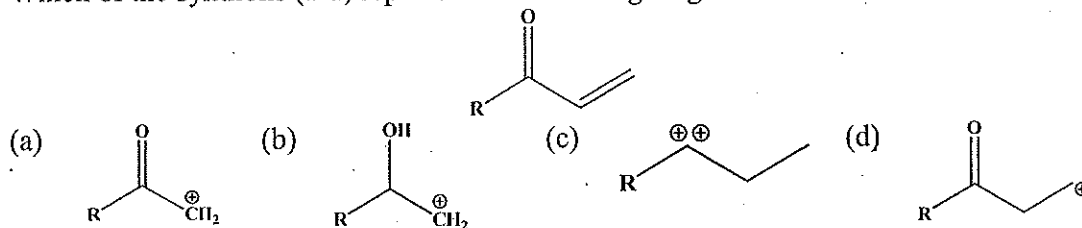
Maximum Marks - 70

Note: Right hand figures indicate marks.

Q.1 Select the correct answer from the option given below for each of the following [08] questions. Write **ONLY ANSWERS** in the provided answer book. [e.g. Q.1 (1)-(b)]

- Which of the following statements best describes a synthon?
  - A synthetic reagent used in a reaction.
  - A key intermediate in a reaction sequence.
  - A transition state involved in a reaction mechanism.
  - A hypothetical structure that would result in a given reaction if it existed.
- \_\_\_\_\_ in the disconnection of 1,6-dicarbonyl compounds.
  - The C<sub>3</sub>-C<sub>4</sub> bond is broken
  - The C<sub>1</sub>-C<sub>2</sub> bond is broken
  - The C<sub>3</sub>-C<sub>4</sub> bond is reconnected
  - The C<sub>1</sub> & C<sub>6</sub> bond are reconnected
- Toluene  $\xrightarrow{\quad ? \quad}$  1-methylcyclohexa-1,4-diene
  - Na/ liq. NH<sub>3</sub>
  - H<sub>2</sub>/Pd-C
  - Hg<sup>+2</sup>, H<sub>2</sub>O/H<sup>+</sup>
  - H<sub>2</sub>O<sub>2</sub>
- Which of the following derivatives is used to protect Amines?
  - Ester
  - Ketal
  - Acetal
  - Phthalamide
- The Darzen reaction is the reaction of ketone or aldehyde with \_\_\_\_\_.
  - an α-haloester in presence of base to give α,β-epoxyester.
  - a β-haloester in presence of base to give α,β-epoxyester.
  - an α-haloester in presence of base to give α,β-unsaturated ester.
  - a β-haloester in presence of base to give α,β-unsaturated ester.

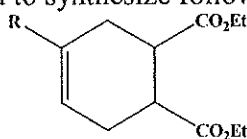
6. Which of the synthons (a-d) represent the following reagent?



7. Umpolung Reaction

- 1,3-dibromo-2,2-dimethylbutane
- 1,3-dibromo-2,3-dimethylbutane
- 1,4-dibromo-2,2-dimethylbutane
- 1,4-dibromo-2,3-dimethylbutane

8. Which name reaction (a-d) is used to synthesize following compound?



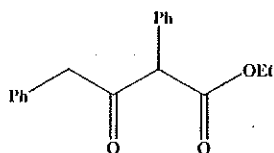
- The Wittig reaction
- The Diels Alder reaction
- The Friedal Crafts Alkylation
- The Claisen reaction

(1)

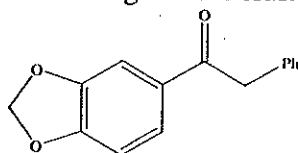
Q.2 Answer ANY SEVEN of the following

[14]

1. Disconnect the following molecule and synthesize it using claisen ester condensation.

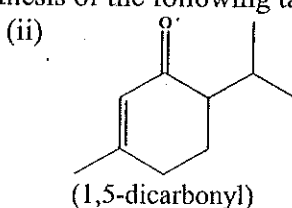
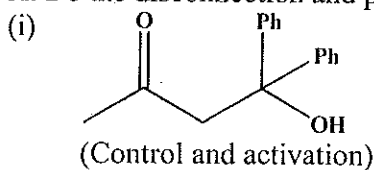


2. Disconnect 3-hydroxy-3-methylbutan-2-one and synthesize it using acetylene as a starting material.
3. Explain the use of enamines in organic synthesis with suitable example.
4. Discuss the protection and deprotection of Alcohols and Amines.
5. Define the term FGI & synthetic equivalent with suitable example.
6. Give in brief about Strecker amino acid.
7. Explain the use of sulphur ylide in preparation of epoxies.
8. Give the synthesis of Pyrrole-3.
9. Synthesize the following molecule using Friedel craft acylation.



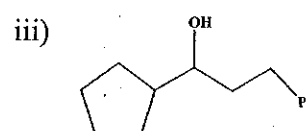
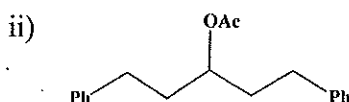
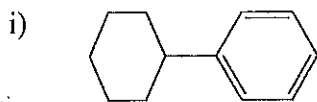
Q.3 A. Do the disconnection and plan the synthesis of the following target.

[06]



B. Do the disconnection & plan the synthesis for the following molecules.

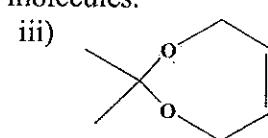
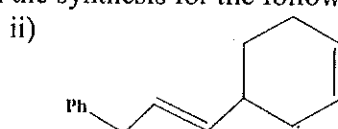
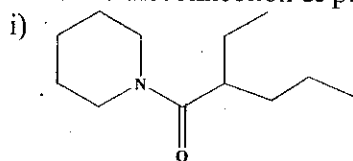
[06]



OR

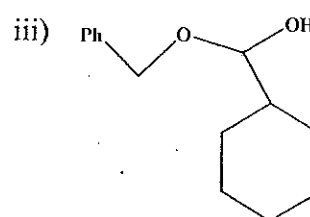
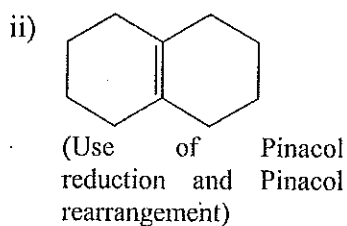
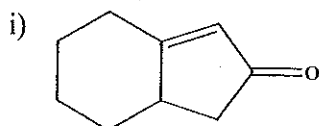
B. Do the disconnection & plan the synthesis for the following molecules.

[06]



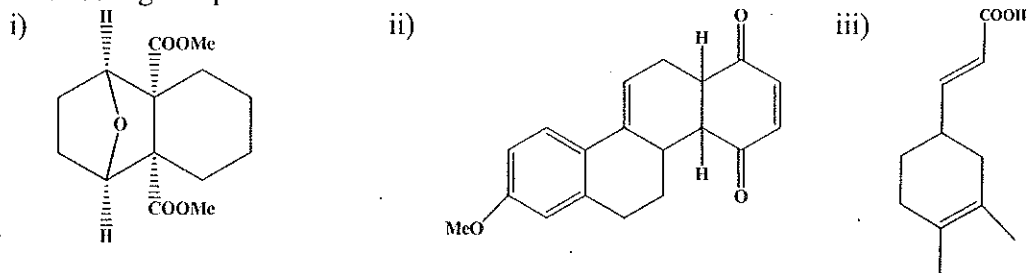
Q.4 A. Do the disconnection and plan the synthesis for the following molecules using given direction.

[06]



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B. Using Diels-Alder reaction, do the disconnection and plan the synthesis of the following compounds. [06]

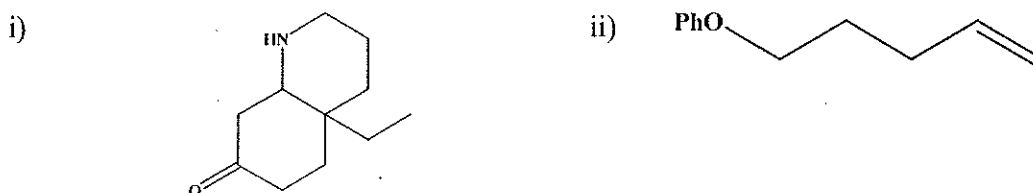


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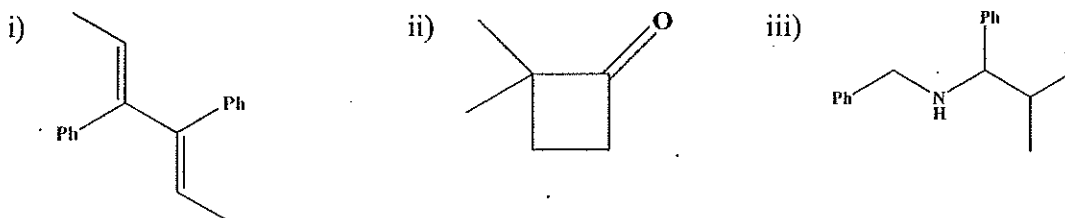
B. Do the disconnection and plan the synthesis of the following compounds. [06]



Q.5 A. Do the disconnection and plan the synthesis for the following heterocycles. [06]

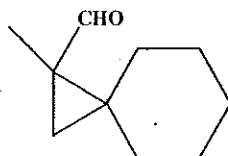


B. Do the disconnection and plan the synthesis of the following compounds. [06]

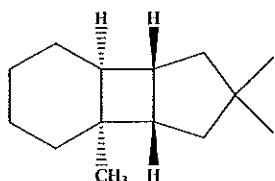


OR

B. (i) Do the disconnection and plan the synthesis for the following molecule using ketene intermediates. [03]

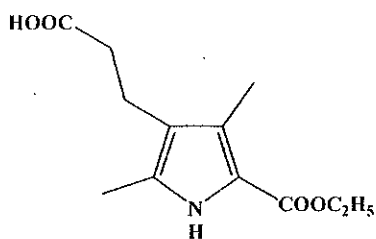


(ii) Using the disconnection for small rings, plan the synthesis for the following compound. [03]

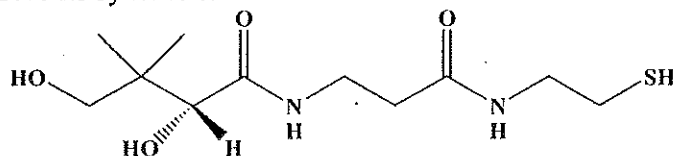


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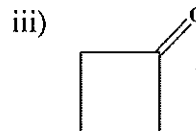
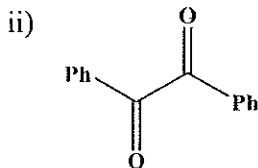
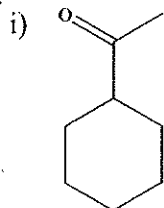
Q.6 A. (i) Give the synthesis of following pyrrole derivative used as intermediate in the synthesis of mesoporphyrin-IX. [03]



(ii) Pantetheine, an intermediate in the synthesis of Coenzyme A has the following structure. Give its synthesis. [03]

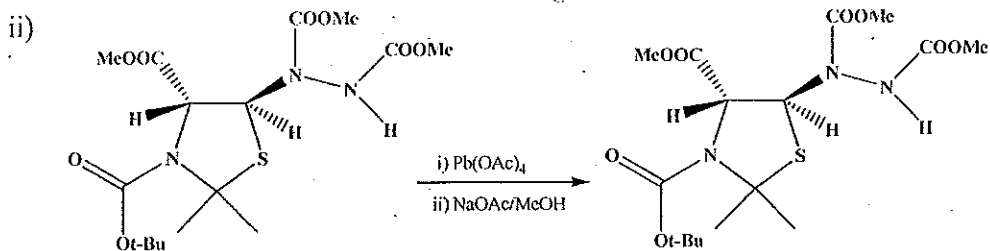
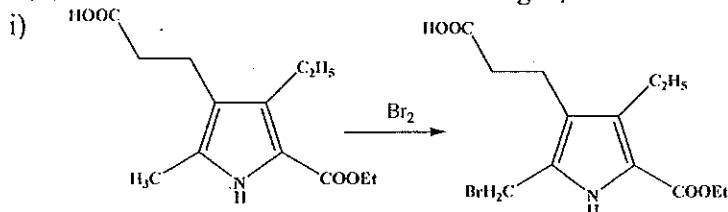


B. What is umpolung? Using umpolung of carbonyl group reactivity, plan the synthesis for the following molecules. [06]



OR

B. Give the mechanism for the following transformation. [06]



— X —