DATE: **23-04-2019**

**ST. JOSEPH’S COLLEGE (AUTONOMOUS), BANGALORE – 27**

**M.Sc : CHEMISTRY : IV SEMESTER**

**SEMESTER EXAMINATION – APRIL, 2019**

**CH 0312 : Organic Synthesis**

**Supplementary students only**

**Please attach the question paper along with answer script.**

**Time: 3 hrs Maximum marks: 100**

Note: This question paper has 4 printed pages and THREE parts.

PART A

Answer any **TEN** of the following: (2 x 10 = 20 marks)

1. What is Prevost reagent? Give an example of a reaction involving this reagent.
2. What is Prins reaction? Give an example..
3. Write structure of the major product formed in the following Barton reaction and propose a suitable mechanism for the same.



1. Explain Birch reduction reaction using a suitable example.
2. Write the mechanism of Henry’s reaction.
3. How will you prepare dicyclohexylcarbodiimide? Give equation for the reaction.
4. What are imine anions? Give an example of their application in alkylation of aldehydes.
5. Explain regioselectivity in the context of enolate formation with an example and reaction conditions.
6. Give any one synthetic application of malonic ester (CH2(COOEt)2).
7. What is ‘latent functionality’? Explain with an example.
8. Explain Robinson annelation with an example.
9. Explain the term ‘disconnection approach’.

PART B

Answer any **FIVE** of the following: (12 x 5 = 60 marks)

1. Write mechanism of the following reactions using suitable example:
2. Noyori reaction
3. Hofmann – Loffler – Freytag reaction
4. Mitsunobu reaction (4 Marks each)
5. Predict the reagent(s) required for the following conversions and write the mechanism of the reactions:

i)



ii)



iii)

(using phase transfer catalyst)

(4 Marks each)

1. How will you synthesise the following using:
2. Stork - enamine reaction



1. Peterson elimination reaction



Iii}



(3 Marks each)

1. (a) What is Sharpless asymmetric dihydroxylation reaction? Give an example and explain the role of each reagent used in the reaction. (6+6)

(b) Discuss any three principles of Green chemistry with suitable illustrations.

1. a) Give one method each for the synthesis of 4, 5 and 6-membered rings, starting from acyclic reactants.

b) Explain the following terms with a suitable example for each:

i) Synthon ii) synthetic reagent ii) Disconnection approach (6+6)

1. a) Outline any three synthetic applications of aliphatic nitro compounds.

b)Discuss how the kinetic and thermodynamic factors influence the formation of 3 to 7 membered rings. (6+6)

1. a) Write a note on the application of protecting groups in organic synthesis by taking the protection of any two functional groups.

b) Show the disconnections of the following target molecule uptodiphenyl and show the synthesis leading to the target molecule:

 (6+6)

PART C

Answer any FOUR of the following: (5 x 4 = 20 marks)

1. Predict the structure of major product(s) formed in the following reactions:

i)



ii)



iii)



iv)



v)

 (1 Mark each)

1. Explain the synthesis of any tripeptide using Merrifield resin method.
2. (a) Synthesise the following compound using Mukaiyama reaction:



(b)Starting from a suitable enamine, outline the synthesis of the following:

 (3+2)

1. Apply disconnection approach and arrive at a plausible synthesis of the following compound:



1. Starting from cyclohexanone, show the synthesis of the following compound:

