



Date:

Registration number:

ST. JOSEPH'S COLLEGE (AUTONOMOUS), BANGALORE-27

M.Sc. Chemistry - III SEMESTER

SEMESTER EXAMINATION: OCTOBER 2021

(Examination conducted in January-March 2022)

OCH 9119 – ORGANIC SYNTHESIS I

Time- 2 1/2 hrs

Max Marks-70

This paper contains FOUR printed pages and THREE parts

PART-A

Answer any SIX out of the following EIGHT questions:

6 X 2 = 12 Marks

1. Name any two green solvents and cite an advantage for each.
2. What is McMurry olefination reaction? Give an example.
3. How would you activate a C-H bond using a free radical mechanism? Give an example.
4. Give an example for Domino reaction.
5. What is an oxidative addition reaction? Cite an example.
6. What is a pre-catalyst and an active catalyst? Cite a suitable example.
7. How will you convert an alkene to a cis-1,2-diol?
8. Explain the Schlenk equilibrium observed in organomagnesium reagents.

PART-B

Answer any FOUR out of the following SIX questions:

4 X 12 = 48 Marks

9. (a) Define atom economy. Calculate the atom economy of the following reaction: synthesis of N-methylpropionamide from ethylpropionate (Atomic mass of : C= 12, H =1, N = 14, O = 16)
$$\text{CH}_3\text{CH}_2\text{COOCH}_2\text{CH}_3 + \text{H}_3\text{CNH}_2 \longrightarrow \text{CH}_3\text{CH}_2\text{CONHCH}_3 + \text{CH}_3\text{CH}_2\text{OH}$$

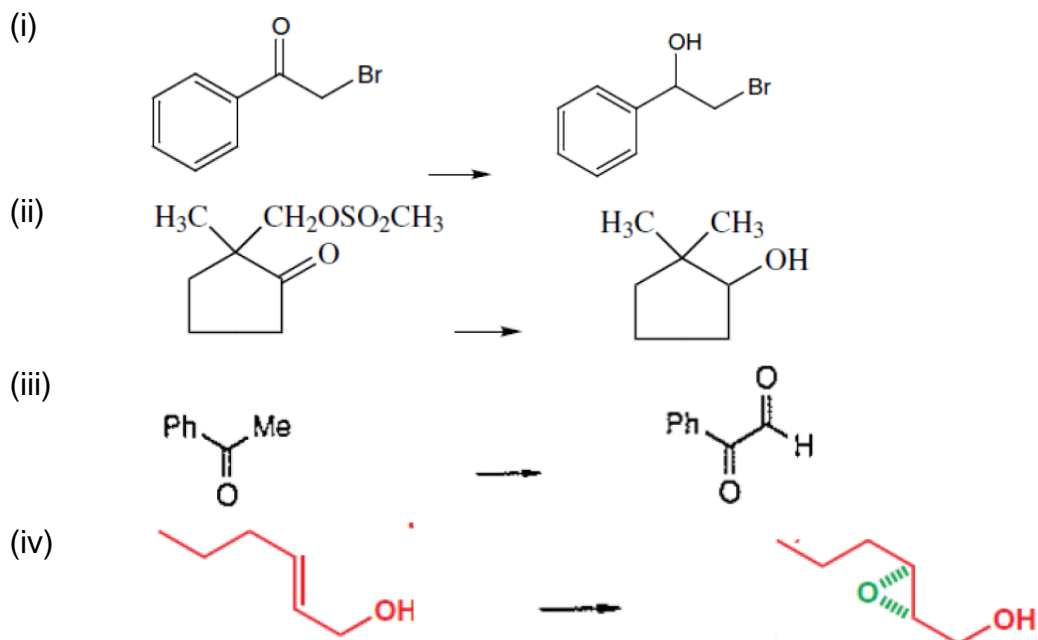
(b) Explain the green principle, "prevention of waste" by using nitration of methybenzoate.

(c) What is C-H activation. Explain the types and importance of C-H activation in organic synthesis. (4+4+4)
10. (a) What is Gilman reagent. How it is prepared and write any two applications of Gilman reagent in organic synthesis.
- (b) What is Simmons-Smith reagent. How it is prepared and write about its application in organic synthesis.
- (c) Describe about the importance of chelating ligands like tetramethylethylenediamine (TMEDA) in lithiation reactions with suitable examples. (4+4+4)

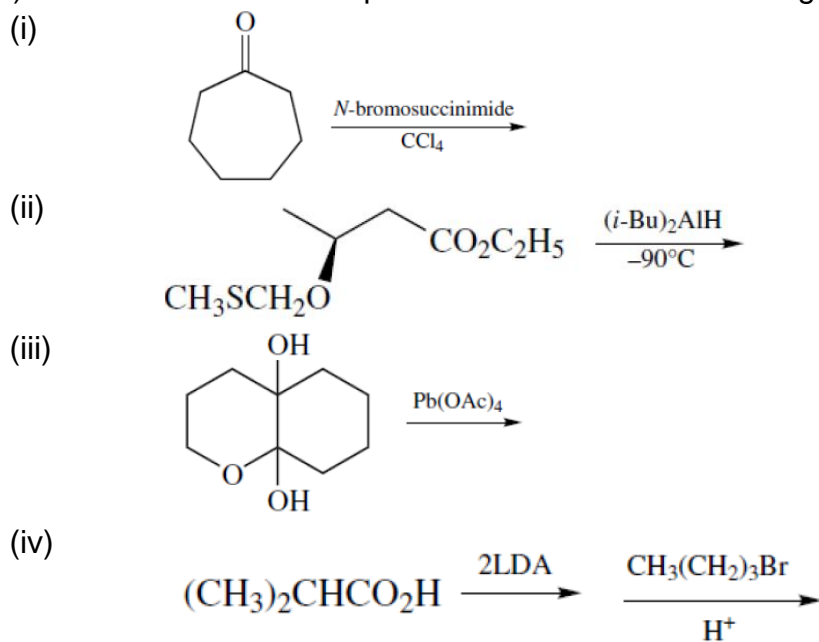
11. Explain mechanism of the following reactions using a suitable example each:

- i) Shapiro reaction
- ii) Suzuki coupling reaction
- iii) Stobbe condensation reaction (4+4+4)

12. a) Predict the reagents required for the following conversions:



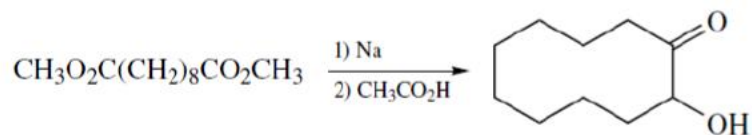
b) Predict the structure of products formed in the following reactions:



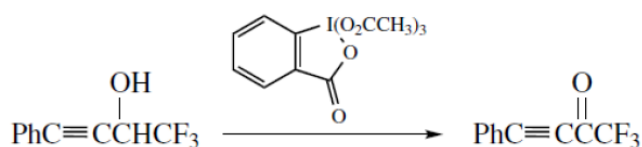
(6+6)

13. (a) Explain mechanism of the following reactions:

(i)



(ii)



(b) Explain the the following reactions using a suitable example each:
(mechanism not required)

(i) Ugi reaction

(ii) Passerini reaction

(6+6)

14. Write a suitable catalytic cycle for the following transition metal catalysed reactions.

(i) Hydrogenation of alkene using $(\text{Ph}_3\text{P})_3\text{RhCl}$

(ii) Mizoroki-Heck coupling reaction

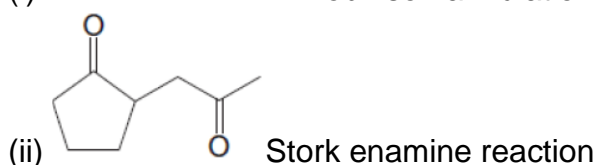
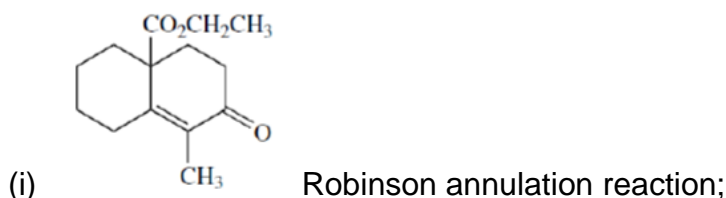
(6+6)

PART-C

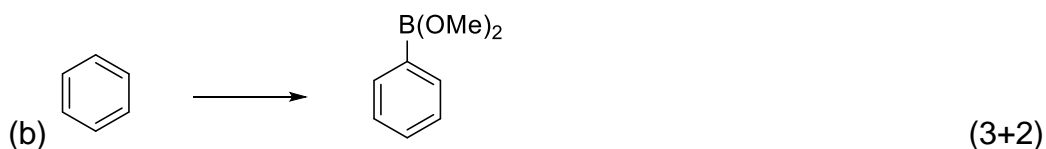
Answer any TWO out of the following THREE questions:

2X 5 = 10 Marks

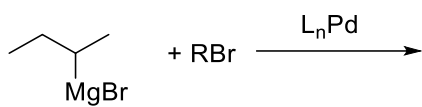
15. How will you synthesise the following compounds using the reactions mentioned below?



16. How will you bring about the following conversion?



17. Predict the major product(s) of the following transformations, when (i) R = Ph, L = PPh₃; (ii) R = Ph, L = diphenylphosphinoferrocene (dppf); (iii) R = PhCH=CH, L = PPh₃; (iv) R = PhCH=CH, L = dppf.



End
