Reg. No..... Name.....

M.SC DEGREE END SEMESTER EXAMINATION OCTOBER 2016

SEMESTER – 3: CHEMSITRY

COURSE: P3CHET10 – ORGANIC SYNTHESES

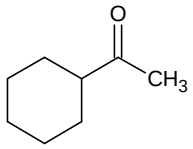
Common for Regular (2015 Admission) & Supplementary / Improvement (2014 Admission)

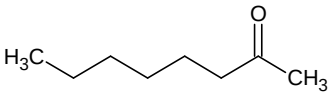
Time: Three Hours Max. Marks: 75

Section A

(*Answer **any** **ten** questions. Each question carries **2** marks*)

1. What is Ritter reaction? Explain how this reaction can be used for the synthesis of a tertiary alkyl amine, $(CH_3)_3NH_2$.
1. Explain Paal-Knorr Thiophene Synthesis of thiophene.
2. What is pyridium dichromate (PDC) reagent? How is it prepared? What are its advantages over PCC?
3. What is Prevost hydroxylation?
4. Write the mechanism of allylic oxidation by SeO_2.
5. What is the product formed when following compounds undergoes Baeyer-Villiger oxidation?

(a) 

(b) 

6. What is Brook rearrangement? Write the mechanism.
7. What is Gilman's reagent? Give any one of its uses in organic synthesis.
8. Discuss any two methods for the synthesis of diols from alkenes.
9. What is Wohl-Zeigler reaction? Write its mechanism.
10. Suggest suitable reagents for the following conversions (a) benzyl alcohol to benzaldehyde (b) ethyl alcohol to acetaldehyde
11. What is the structure of sodium cyanoborohydride? Explain its use in reductive aminations.
12. Suggest suitable synthetic equivalents for following synthones (a) $^{+}HC{=}O$ (b) Ar^{+}

(2 × 10 = 20)

Section B

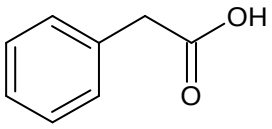
(*Answer **any five** questions. Each question carries **5** marks*)

13. What is Noyori asymmetric hydrogenation reaction? Explain how both enantiomers of

CH_3-CH(OH)-CH_2-CO-OCH_3 are obtained from CH_3-CO-CH_2-CO-OCH_3 using this reaction. Write the mechanism involved in the reduction.

14. Explain the mechanism following epoxidation reactions (a) Sharpless epoxidation (b) Shi Epoxidation.
15. Briefly explain the basic steps involved in the biosynthesis of morphine
16. Write a note on the enantioselective synthesis of Corey lactone and luciferin.
17. Explain following two reactions with suitable mechanism (a) Baylis-Hillman reaction (b) Henry reaction.
18. Explain the use of ring closing metathesis for the construction of macrocyclic rings.
19. What is meant by 'umpolung strategy' in organic synthesis? Based on this method suggest a method for the following conversions
    (a) CH_2=O → R-CO-R (b) CH_3-CHO → CH_3-CO-CH_2-Ph

20. On the basis of a retrosynthetic analysis suggest a suitable synthetic strategy for preparing following compound



(5 × 5 = 25)

Section C

(*Answer **any two** questions. Each question carries* **15** *marks*)

21. Briefly explain principles involved in the biosynthesis of (a) glucose (b) morphine
22. Discuss application of $LiAlH_4$, $NaBH_4$, Red-Al, DIBAL-H and selectrides in organic synthesis.
23. Discuss the protection and deprotection methods of hydroxyl, carboxyl, carbonyl and amino groups in organic synthesis.
24. Discuss following coupling reactions with appropriate mechanisms:
    (a) Nozaki-Hiyama
    (b) Buchwald-Hartwig
    (c) Suzuki
    (d) Suzuki-Miyaura.

(15 × 2 = 30)

****