

M. Sc. DEGREE END SEMESTER EXAMINATION : NOVEMBER 2023**SEMESTER 3 : CHEMISTRY / PHARMACEUTICAL CHEMISTRY****COURSE : 21P3CHET10 / 21P3CPHT10 : ORGANIC SYNTHESSES***(For Regular - 2022 Admission and Supplementary - 2021 Admission)*

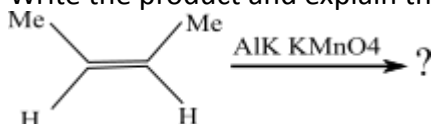
Duration : Three Hours

Max. Weights: 30

PART A**Answer any 8 questions****Weight: 1**

1. Explain how 1,3-dithianes helps in the protection of a carbonyl group. (A, CO 4)
2. What are synthons and synthetic equivalents? ()
3. Disconnect 1-phenyl-1-propanone and show the synthons and corresponding synthetic equivalents. ()

4. Write the product and explain the reaction.



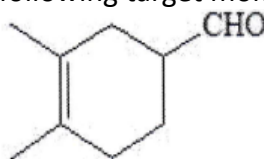
(U, CO 1)

5. Write briefly on the design principles for a receptor. (U, CO 4)
6. What are the advantages of solid phase peptide synthesis (SPPS) over solution phase peptide synthesis? (U, CO 4)
7. Write the product and explain the reaction.

$$\text{PhCH}=\text{CH}-\text{CH}_2\text{OH} \xrightarrow[\text{C}_6\text{H}_{14}, 2\text{Hrs}]{\text{PCC, Al}_2\text{O}_3} ?$$

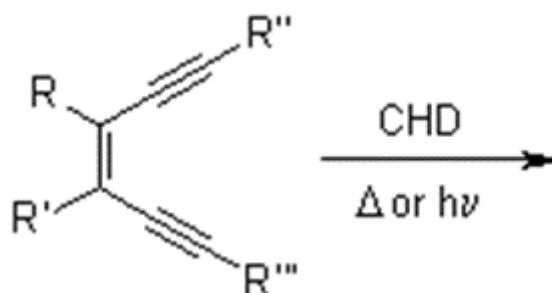
(A, CO 1)

8. Apply retrosynthetic analysis and suggest a suitable synthesis of the following target molecule.



()

9. Explain the use of DCC in peptide coupling reactions?: (E, CO 2)
10. Explain the mechanism of the following reaction.



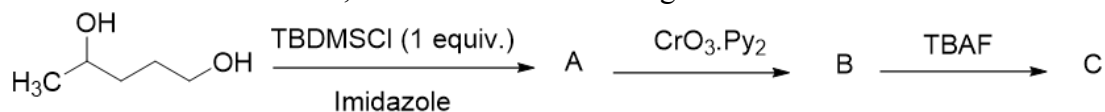
(A, CO 3)

(1 x 8 = 8)

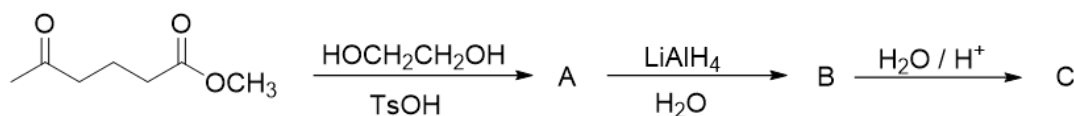
PART B
Answer any 6 questions

Weights: 2

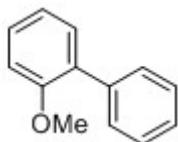
11. With the help of protecting group chemistry suggest a synthetic strategy for the conversion of (S)-2-formyl-3-hydroxypropanoic acid into (R)-2-formyl-3-hydroxypropanoic acid. (Cr)
12. Explain McMurray coupling with mechanism. (U, CO 1)
13. Give an example with mechanism of a coupling reaction involving transmetallation with Cu(I) catalyst? (R, CO 2)
14. Discuss the mechanism and synthetic applications of MPV reduction. (U, CO 1)
15. Predict the structures of A, B and C in the following reactions.



(A, CO 4)



16. Discuss the basic principles and terminology of retrosynthetic analysis. (I)
17. Write any two methods for the synthesis of 5-membered ring compounds. (U, CO 3)
18. How will you synthesize the following from iodo benzene?



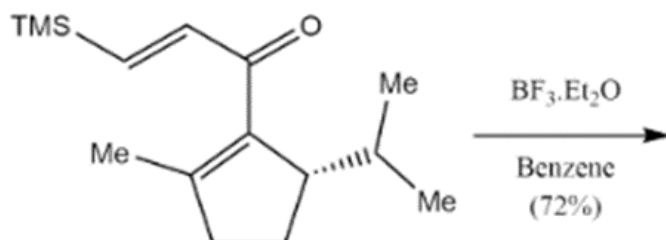
(A, CO 2)

(2 x 6 = 12)

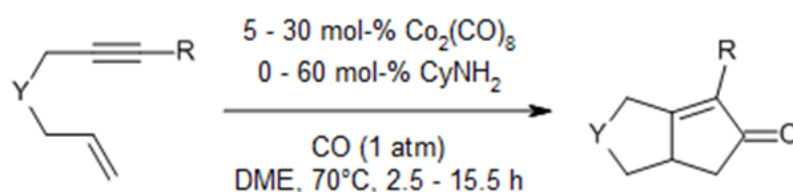
PART C
Answer any 2 questions

Weights: 5

19. Explain the mechanism of the following reactions.



(A, CO 3)



20. Write briefly on the reducing agents
 - i). Baker's yeast
 - ii). Aluminium iso-propoxide
 - iii). NaBH₄
 - iv). NaBH₃CN
 (U, CO 1)

21. Discuss the different interactions and types of receptors in supramolecular chemistry. (U, CO 4)
22. Write an essay on metal mediated C-C and C-X coupling reactions with reference to (R, CO 2)
 a) Negishi Sonogashira b) Stille Coupling c) Nozaki-Hiyama reaction.
(5 x 2 = 10)

OBE: Questions to Course Outcome Mapping

CO	Course Outcome Description	CL	Questions	Total Wt.
CO 1	Describe the applications of oxidation and reduction techniques in organic syntheses.	A	4, 7, 12, 14, 20	11
CO 2	Illustrate modern synthetic methods and applications of reagents.	U	9, 13, 18, 22	10
CO 3	Explain different methods for the construction of carbocyclic and heterocyclic ring systems.	U	10, 17, 19	8
CO 4	Understand the principles and applications of protecting groups in chemistry.	U	1, 5, 6, 15, 21	10

Cognitive Level (CL): Cr - CREATE; E - EVALUATE; An - ANALYZE; A - APPLY; U - UNDERSTAND; R - REMEMBER;