Reg. No ..... Name **25P319-S**

M. Sc. DEGREE END SEMESTER EXAMINATION - OCTOBER 2025

SEMESTER 3 : CHEMISTRY / PHARMACEUTICAL CHEMISTRY

COURSE : **21P3CHET10 / 21P3CPHT10 : ORGANIC SYNTHESES**

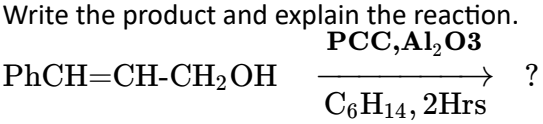
(For Supplementary 2023/2022/2021 Admissions)

Duration : Three Hours Max. Weights: 30

PART A

Answer any 8 questions **Weight: 1**

1. Give the name and structure of any two amino protecting groups. (U, CO 4)
2. Explain a synthetic strategy for amines involving amide ion (NH_2^-) synthon. ()
3. Discuss ring closing metathesis. (U, CO 3)
4. Write the product and explain the reaction.

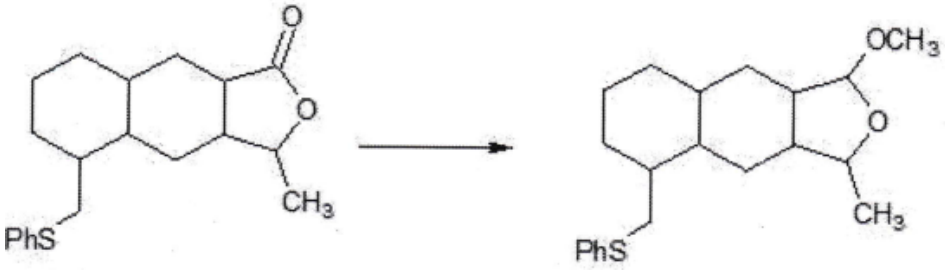


(A, CO 1)

5. Give the synthetic equivalents for the following synthons.

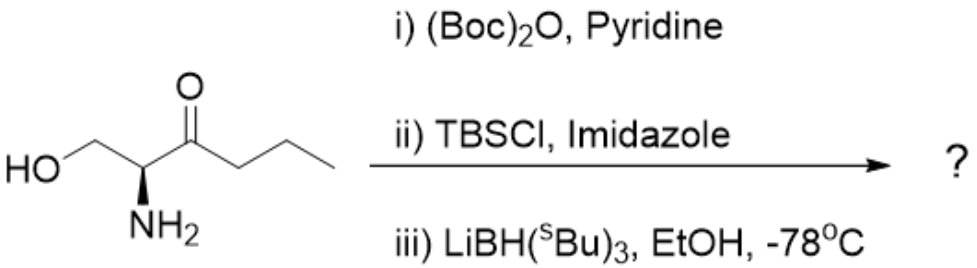
()

6. Give a method for the following conversion.

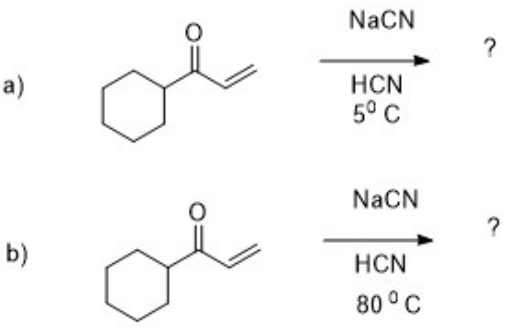


(An, CO 1)

7. Write briefly on host and guest interaction in supramolecular chemistry. (U, CO 4)
8. Predict the structure of the product formed during each step of the following reaction sequence



(A, CO 4)

9. Explain the role of trialkylsilyl derivative in Peterson Olefination reaction. ()
10. 

(A, CO 2)

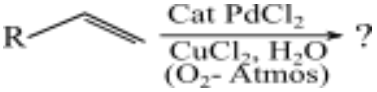
(1 x 8 = 8)

PART B

Answer any 6 questions **Weights: 2**

11. Show all the steps involved in the synthesis of dipeptide, Gly-Ala. (A, CO 4)

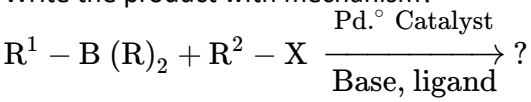
12. Convert and write the mechanism



(A, CO 1)

13. Write a brief note on the various trialkyl silyl protecting groups used in organic synthesis (U, CO 4)

14. Write the product with mechanism?



(E, CO 2)

15. Give an account of the reagents Ag_2CO_3 and RuO_4 (U, CO 1)

16. Discuss Demjanov ring contraction and expansion reactions. (E, CO 3)

17. Apply retrosynthetic analysis and devise a synthetic route for d-luciferin. (R, CO 5)

18. Give an example with mechanism of a coupling reaction involving transmetallation with Cu(I) catalyst? (R, CO 2)

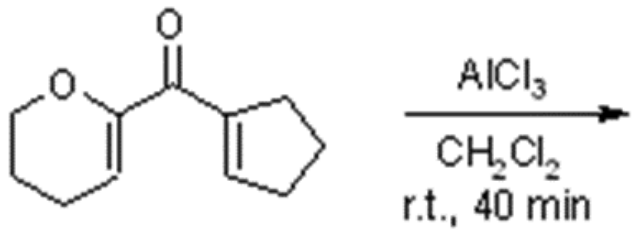
(2 x 6 = 12)

PART C

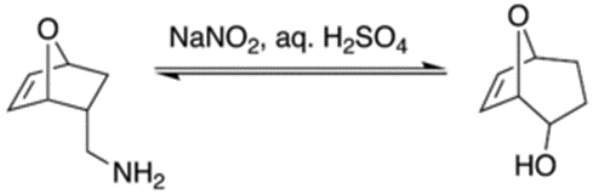
Answer any 2 questions **Weights: 5**

19. Explain the mechanism of the following reactions.

i)

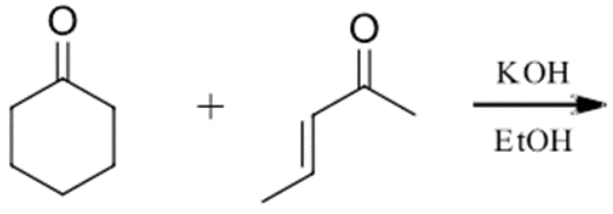


ii)



(An, CO 3)

iii)



20. Discuss the structure, shape and applications of calixarenes, cryptands and cyclodextrins. (U, CO 4)

21. Draw the organic products formed when cyclopentene is treated with the following reagents. Give the mechanisms of the reactions of h, i and j (E)

a. H_2 + Pd-C b. H_2 + Lindlar catalyst c. Na, NH_3, d. CH_3CO_3H

e. (1) CH_3CO_3H (2) H_2O, -OH f. (1)OsO_4, NMO, (2) $NaHSO_3$ g. $KMnO_4$, H_2O, -OH

h. (1) $LiAlH_4$, (2) H_2O i. (1) O_3, (2) CH_3SCH_3 j. mCPBA

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, 6, 12, 15	6
CO 2	Illustrate modern synthetic methods and applications of reagents.	U	10, 14, 18, 22	10
CO 3	Explain different methods for the construction of carbocyclic and heterocyclic ring systems.	U	3, 16, 19	8
CO 4	Understand the principles and applications of protecting groups in chemistry.	U	1, 7, 8, 11, 13, 20	12
CO 5	Apply retrosynthetic analysis to design the synthesis of a target molecule.	U	17	2

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