D 71435 (Pages : 4) Name..... 105

Reg. No.....

THIRD SEMESTER M.Sc. DEGREE EXAMINATION, DECEMBER 2014

(CUCSS)

Chemistry

CH 3E 01—SYNTHETIC ORGANIC CHEMISTRY

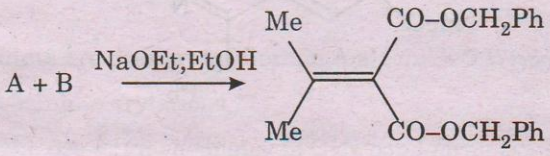
(2010 Admissions)

Time : Three Hours Maximum : 36 Weightage

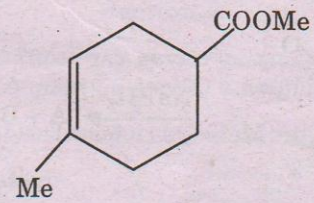
Section A

Answer **all** *questions.*
Each question carries 1 *weightage.*

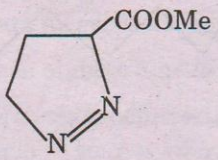
1. Identify the reactants A and B in the following synthesis.



2. Using a Diels-Alder reaction, show how the molecule below may be obtained.

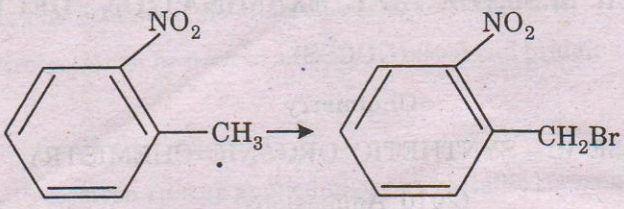


3. How can the heterocyclic compound below be prepared by a [3 + 2] 1, 3–dipolar cycloaddition ?

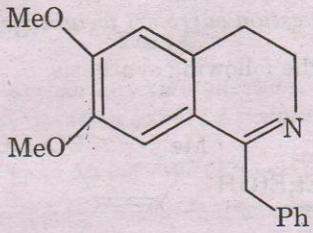


Turn over

4. Suggest a method for carrying out the following bromination in one step.

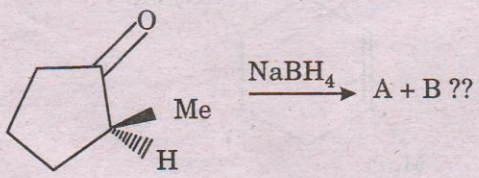


5. Develop a synthetic scheme for preparing the compound below using Ph–CH_2–CO–Cl as o the starting material ... F747

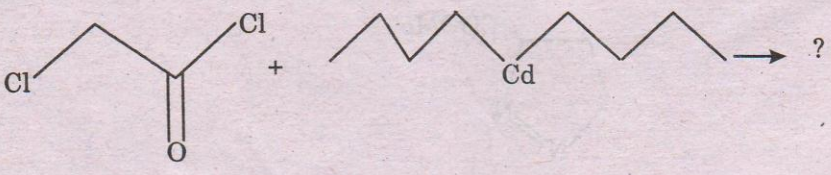


6. What are the methods available for the formation of a C–N triple bond as in a – C ≡ N grou

7. Identify the two isomeric products possible in the following reduction.



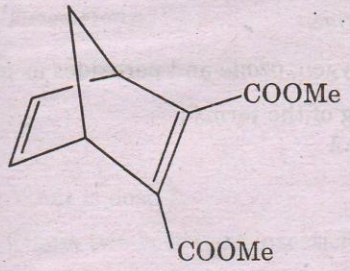
8. Chloroacetyl chloride was reacted with $(n - Bu)_2$ Cd What would be the product ?



9. Complete the following equation :

$$C_6H_6 + Cr(CO)_6 \longrightarrow ? \xrightarrow[(ii)\ I_2 \text{ at } -25°C]{(i)\ Li^{+}\ {}^{-}CH_2CN} ?$$

10. Execute a retro-synthetic analysis for the compound shown below:



11. How many isoprene units are present in Vitamin A aldehyde ? Write the structure of Vitamin A.

12. What are Pd-catalysed amine arylations ?

13. Write an example of the use of Pd chemistry in C–N bond formations.

14. How can 2-phenylthiazole be prepared ?

(14 × 1 = 14 weightage)

Section B

Answer any **seven** *questions.*
Each question carries 2 *weightage.*

15. Exemplify the use of base catalysed condensations as a tool for forming carbon-carbon bonds.

16. Write a note on photohalogenations.

17. Explain with examples the use of :

    (a) Catalytic hydrogenations ; and

    (b) SeO_2 in organic synthesis.

18. What is Gilman reagent and what are its synthetic applications ?

19. Illustrate the use of metal hydrides in organic functional group transformations.

20. Explain the use of functional group protection-deprotection strategies in organic in organic synthesis. Use amino group as a typical example in your answer.

21. Write the synthesis of longifolene.

22. Discuss the mechanism and scope of Stille coupling.

23. Establish with examples the synthetic utility of Sonogashira couplings.

24. How can guanine and thymine be synthesized ?

(7 × 2 = 14 weighta

Section C

Answer any **two** *questions.*
Each question carries 4 *weightage.*

25. Enumerate with suitable example the synthetic uses of oxygen, ozone and peroxides as oxida

26. With the aid of appropriate examples, explain the meaning of the terms :

    (a) Umpolung ; and

    (b) Synthon and synthetic equivalents.

    (c) Disconnection ; and

    (d) Functional group interconversion FGI.

27. Describe the salient steps in the synthesis of cephalasporins.

28. Write the general methods for obtaining :

    (a) Oxazole.

    (b) Furanones.

    (c) Caffeine ; and

    (d) Pyrazine.

(2 × 4 = 8 weigl