F 4679 (Pages : 3) Reg. No.....

Name.....

M.Sc. DEGREE (C.S.S.) EXAMINATION, JANUARY 2017

Third Semester

Faculty of Science

Branch III : Chemistry

AN3 C10/CH3 C10—ORGANIC SYNTHESES

(Common to M.Sc. Analytical Chemistry and Chemistry)

[2012 Admission onwards]

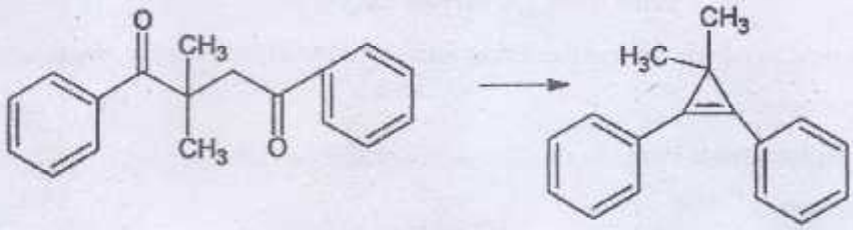
Time : Three Hours Maximum Weight : 30

Section A

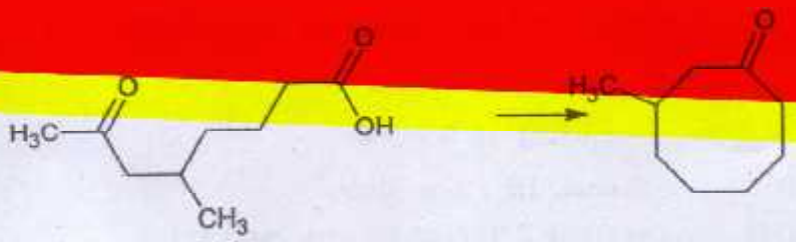
Answer any **ten** *questions.*
Each question carries a weight 1.

1. What is Bergman cyclisation ? What is its use? What is its special advantage over usual cyclisation reactions ?
2. Explain the terms biogenesis, biosynthesis and biomimetic synthesis.
3. Name three common carboxyl group protecting groups used in peptide synthesis.
4. What are the important uses of :
   (a) $LiAlH_4$.
   (b) DMSO.
5. Describe 'Jacobson epoxidation' ? What are its applications ?
6. What are oxetanes ? How they are produced photochemically ?
7. Give *one* example each for. Demyanov ring expansion and ring contraction.
8. Suggest suitable reagents for the following conversions.

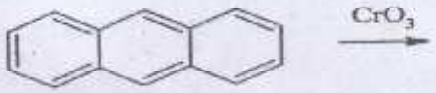
(i)

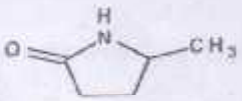


Turn over

(ii) 

9. Predict the products of the following reactions.

(i) 

(ii) 

10. What is DIBAL-H ? What is the special advantage in using DIBAL-H over $LiAlH_4$.

11. What are the advantages of Osmium tetroxide compared to $KMnO_4$ in hydroxylation of alkenes ? What are the disadvantages ?

12. Explain the following reactions using suitable examples :
    (a) Tebbe olefination.
    (b) Noyori reaction.

13. What is DDQ ? Explain its use in the synthesis of aromatic compounds using suitable examples.

(10 × 1 = 10)

Section B

Answer any **five** *questions.*
Each question carries weight 2.

14. Give three different methods for synthesizing four membered carbocyclic compounds.

15. Explain with examples :
    (a) Baylis-Hillman reaction.
    (b) Nef reaction.
    (c) Glaser coupling.
    (d) Buchwald-Hartwig reaction.

16. Give the total synthesis of Luciferin.

17. Explain with suitable examples the important roles played by trimethyl silyl group in modern organic synthesis.

18. Write down the important intermediates formed in the biosynthesis of proteins.

19. Give the mechanism of the following reactions.

    (a) Sharpless asymmetric epoxidation.

    (b) Wood ward modification of Prevost reaction.

    (c) Selenium dioxide oxidation

20. Explain with examples the following metal mediated coupling.

    (a) Ullman reaction.

    (b) Nozaki-Hiyama coupling.

    (c) Suzuki coupling.

    (d) Sonogashira coupling.

21. What is Hydroboration ? Give the mechanism of the reaction. Show how the reaction is useful in the synthesis of large variety of compounds.

(5 × 2 = 10)

Section C

Answer any **two** *questions.*
Each question carries weight 5.

22. What is solid phase peptide synthesis (SPPS) ? What is the special advantage of it compared to solution phase peptide synthesis ? How the following tetra peptide can be synthesized by SPPS-Cys-Glu-Ala-Gly.

23. (a) Give the biomimetic synthesis of Spatreine.

    (b) Write down the Enatioselective synthesis of Longifolene.

24. How the following heterocyclic synthesized ?

    (a) Imidazole.

    (b) Thiazole.

    (c) Oxazole.

    (d) Thiophene.

25. Write down the important steps in the biosynthesis of cholesterol starting from acetyl coenzyme-A.

(2 × 5 = 10)