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Reg. No.....

Name.....

M.Sc. DEGREE (C.S.S.) EXAMINATION, FEBRUARY 2021

Third Semester

Faculty of Science

Branch V-B : Pharmaceutical Chemistry

PH 3C 09—SYNTHETIC AND BIO-ORGANIC CHEMISTRY

(2012—2018 Admissions)

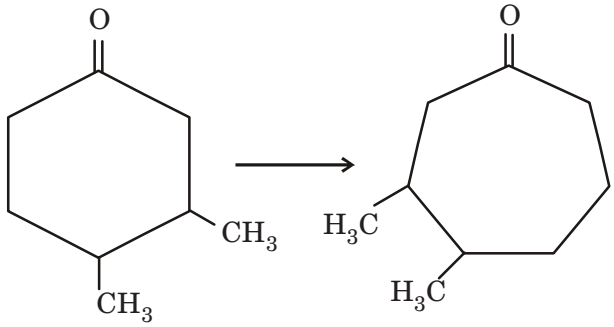
Time : Three Hours Maximum Weight : 30

Section A

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

1. Name the important classes of steroids and give one example for each class.
2. Draw the structure of Cholesterol showing the different stereo centres and explain the optical activity of the compound.
3. Give the important steps involved in the conversion of Cholesterol into Testosterone.
4. What is Hofmann's exhaustive methylation ? Explain its use in the structure elucidation of alkaloids using a suitable example.
5. Give the structures of the following molecules :

   a) Vitamin B_1 ; b) Vitamin C ; and c)Streptomycin.
6. What are Oxetanes ? How they are synthesised ?
7. What is meant by controlled release phenomena in medication ? Explain using a specific example.
8. What is a supramolecular complex ? Explain its use in the field of perfumery.
9. What are the different types of forces that are helpful in understanding molecular recognition ?
10. How the following change is brought out ? State the reagents and name the reaction used.



Turn over

11. What is Wacker oxidation ? Explain its industrial significance.

12. What are the reagents used in Prevost reaction ? Give an example.

13. What is Aza-Cope rearrangement ? Explain using a suitable example.

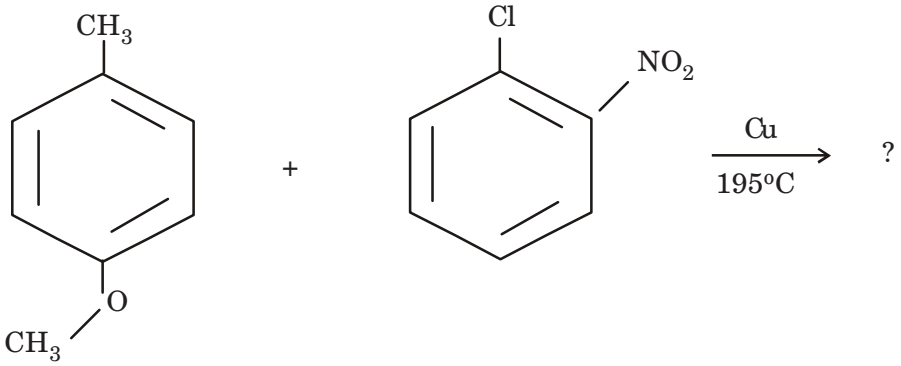
(10 × 1 = 10)

Section B

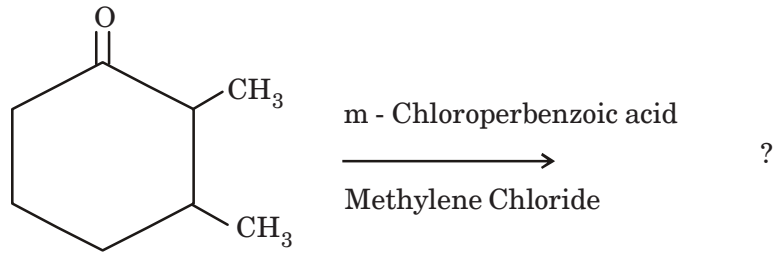
Answer any **five** *questions.*
Each question carries a weight of 2.

14. Give the products in the following reactions.

a)



b)



15. Explain the synthetic uses of : 1) Osmium tetroxide ; 2) DIBAL-H.

16. What is Sharpless asymmetric epoxidation ? Explain using a suitable example.

17. Define the term Asymmetric synthesis. What is meant by chiral pool synthesis ? Give an example.

18. Give the mechanisms of : a) Nef reaction ; b) Tishchenko reaction.

19. Using suitable examples explain the following reactions : a) Nazarov cyclisation ; b) Suzuki coupling.

20. Explain the following coupling reactions using suitable examples : 1) Stille coupling ; 2) Suzuki coupling.

21. What is Birch reduction ? Give the mechanism of the reaction. What are its uses in organic synthesis ?

(5 × 2 = 10)

Section C

Answer any **two** *questions.*

Each question carries a weight of 5.

22. Discuss briefly on the oxidation of alcohols to carbonyl compounds using the following metal compounds : a) Chromium ; b) Manganese ; c) Aluminium ; d) Silver.

23. Give the important steps involved in the total synthesis of the following compounds : a) Papaverine ; b) Vitamin-A.

24. Write notes on : a) Crown ethers ; b) Carbon nanocapsules ; c) Cyclodexrins ; d) Cryptands.

25. Discuss briefly on the following : a) β-lactam antibiotics ; b) Ring closing metathesis.

(2 × 5 = 10)