F 7739 (Pages : 4) Reg. No.....

Name.....

M.Sc. DEGREE (C.S.S.) EXAMINATION, FEBRUARY 2014

First Semester

Faculty of Science

Branch : Chemistry

ANIC02/APIC02/CHIC02/PHIC02/POHIC02—STRUCTURAL AND MOLECULAR ORGANIC CHEMISTRY

(Common to all Branches of Chemistry)

[2012 Admission onwards]

Time : Three Hours Maximum Weight : 30

Section A

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

1. Arrange the following in the increasing order of their acidity and comment on it - α-chlorobutyric acid, β chlorobutyric acid, γ – chlorobutyric acid and *n*-butyric acid.
2. Explain the aromatic character of Tropylium ion using Huckel's rule.
3. How NMR is used as a tool for aromaticity ?
4. Which give white precipitate when treated with alcoholic $AgNO_3$ and why - chlorobenzene and Benzyl chloride.
5. What is secondary kinetic isotopic effect.
6. What is Hammond postulates.
7. Explain the mechanism of ester hydrolysis by $A_{AC}2$ mechanism.
8. What is prostereoisamerism ?
9. Draw structure of (±) erythro and threo - 3- bromo - 2 - butanol.
10. Give *four* example each for achiral and chiral objects that's commonly used in day to day life.
11. Mention the factors on which the stability of conformation depends.

Turn over

12. Draw the energy profile diagram of conformational isomers of cyclohexane. Name the each forms.

13. Draw and explain the stereo chemical relation behind the formation of 2-butene from meso and dl 2, 3.-dibromobutane.

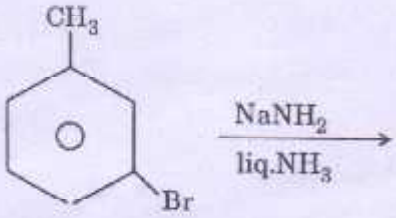
(10 × 1 = 10)

Section B

Answer **five** *questions by attempting not more than 3 questions from each bunch.*
Each question carries a weight of 2.

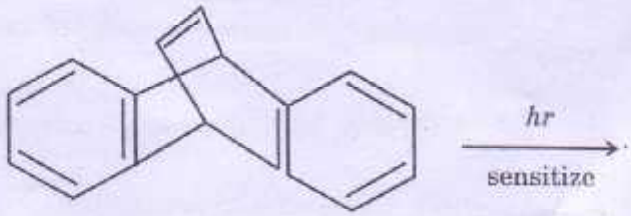
BUNCH 1 (PROBLEM TYPE)

14. Predicts the products and explain the mechanism of following :

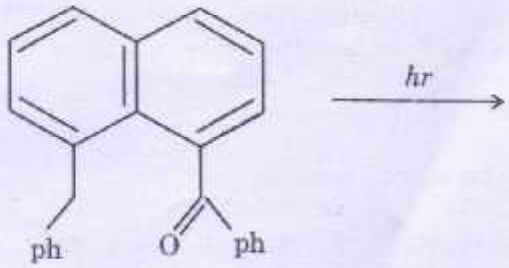


15. Complete the following reaction.

(a)



(b)



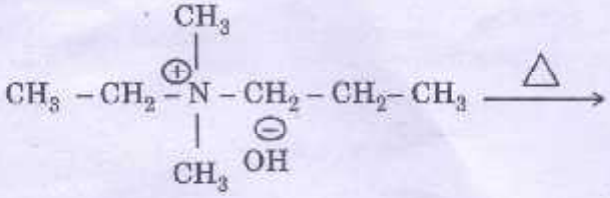
16. (a) Assign R or S configuration of following :

(i)

(ii)

(b) Draw the R and S configuration of trans-cyclooctene.

17. Predicts the products and explain the mechanism of following :

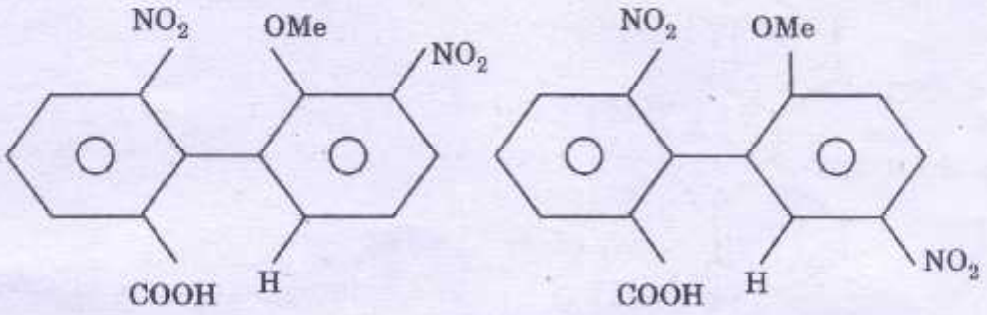


BUNCH 2 (SHORT ESSAY TYPE)

18. Explain the conditions of aromatic nature of neutral and charged aromatic system with suitable example.

19. Discuss Norrish type I reaction with mechanism.

20. (a) Rate of racemization of 3-nitro derivative of following compound is much lower than that of its 5-nitro derivative. Why ?



(b) Draw the structure of Chiral Diphenic acid.

21. Draw the chair conformation of *cis* and *trans* decalin. Predict and explain which one is Chiral and more stable.

(5 × 2 = 10)

Section C

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

22. (a) Discuss S_N1, S_N2 and S_NAr mechanism with suitable example.

(b) Explain Inductive effect and Hyper conjugation.

23. (a) Give a detailed account on $A_{AL}1$ and $B_{AC}2$ mechanism of ester hydrolysis with experimental evidence.

(b) Briefly explain photoreactions of dienones and arenes with suitable example.

24. Give an account of axial and planar chiral molecules. Explain with suitable example.

25. Illustrate the conformational analysis of cyclic and acyclic systems.

(2 × 5 = 10)