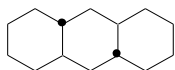


Group C

Answer any *two* bits:

2x8=16

13. Draw all possible diastereomers of perhydroanthracene in 2D and 3D. Based on your 3D drawings, rank each structure in terms of energy. Clearly identify all gauche-butane, syn-pentane and flagpole interactions. And also comment on their chiralities.
14. (i) Predict the sign of Cotton effect, with proper octant projection diagram, of the following compounds:
- (a) (S)-2-fluorocyclohexanone
(b) (2S, 5R)-2-Chloro - 5-methylcyclohexanone.
15. Draw the conformational structure of the following isomer of perhydroanthracene. Mention and explain the following regarding this isomer. (i) the sign of torsion angle at the ring junction within the central ring, (ii) the symmetry and chirality, (iii) additional interaction energy.



16. (i) Write a detail note on exciton chirality rule and Davydov splitting.
(ii) Discuss lower's rule with a suitable example. (4+4)

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Internal Assessment-10

2025

M.Sc.

4th Semester Examination

CHEMISTRY

PAPER – CEM-403 (*Advanced Organic Chemistry-IV*)

Full Marks: 50 Time: 2 Hours

Group A

Answer any *four* bits:

2x4 = 8

1. What is importance of Bürgi-Dunitz trajectory?
2. In case of menthone, the diaxial conformer is more preferred than diequatorial conformer. Give reason for this observation.
3. Write down the advantages of Felkin-Anh model.
4. Compare the stability of *trans*- decalin and *cis*-decalin.
5. Draw all possible stereoisomers of *trans*-2-decalol.
6. Write down the structure of all isomers of perhydrodiphenic acid.

Group B

Answer any *four* bits:

4x4 = 16

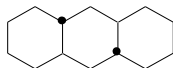
7. The equilibrium data shows that in case of 2-bromo-4-*t*-butylcyclohexanones the axial isomer predominates to the extent of 78% in CCl₄ and to the extent of 63% in dioxane. Explain the observation.
8. What changes are observed in the nature of butane-gauche interactions when a methyl group is introduced at one of the bridgehead carbon atoms of *trans*- and *cis*-decalins. Comment on their symmetry point group and resolvability.
9. What are the applications of Curtin-Hammett equation? Give one example.
10. Describe the application of ORD and CD spectroscopy.
11. Draw the Cram and Felkin-Anh models for (*S*)- benzoin and show that reaction with CH₃MgI gives the same stereochemical outcome.
12. What is circular birefringence? What is α -haloketone effect?

Group C

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16. (i) Write a detail note on exciton chirality rule and Davydov splitting.
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Internal Assessment-10

2025

M.Sc.

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