



BBC-003-1104007

Seat No. _____

M. Sc. (Sem. IV) (CBCS) Examination

July - 2021

C(OP)-403 : Stereochemistry

Faculty Code : 003

Subject Code : 1104007

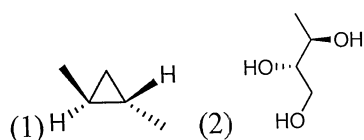
Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

- Instructions :** (1) All questions carry EQUAL marks.
(2) Attempt any five questions.

1 Answer the following: 14

- (a) Write the name of following compounds:



- (b) Differentiate Configuration and Conformational isomers.
(c) Define the terms: Constitutionally heterotopic ligands & Homomorphic groups.
(d) Draw the fisher projection formula for 1R-2R and 1R-2S tartaric acid.
(e) Explain Enantiotopic and Diastereotopic atoms.
(f) Draw the staggered and Gauche conformers of Methylcyclohexane.
(g) Point out variation in J values with different parameters.

- 2** Answer the following : **14**
- (a) Draw the structure of following compounds :
 - (1) (3R,4S)-3-methyltetrahydro-2H-pyran-4-ol
 - (2) (2R)-1-chloro-2-methylbutan-2-ol
 - (b) Draw the structure of 2R,3R and 2S,3S of 2,3-Dichloro-2,3-dihydroxy butane.
 - (c) Define the terms: Enantiomers and Diastereomers.
 - (d) Name the factors affecting the stability of conformations.
 - (e) Draw the cis and trans decalin conformation.
 - (f) What is a prochiral center? Explain with a suitable example.
 - (g) Define the term optical isomer and how you will calculate the number of optical isomers.
- 3** Answer the following: **14**
- (a) Explain Cram's rule using a Felkin-Anh model with suitable examples.
 - (b) Give classification of stereoregular polymers and discuss diene polymerization.
- 4** Answer the following: **14**
- (a) What is circular birefringence? Discuss its causes in any molecule with one example of each.
 - (b) Discuss Enantiotopic and homotopic ligands and faces with suitable examples.
- 5** Answer the following: **14**
- (a) Write a note on the stereochemistry of the 6-membered cyclic compound concerning the Karplus curve.
 - (b) Define the term dihedral angle and discuss its relation with coupling constant with suitable examples.

- 6** Answer the following: **14**
- (a) Discuss molecular rearrangement and NGP in the bromination of 2-Bromo-3-butanol.
 - (b) Explain flipping in cyclohexane with different substituents attached.
- 7** Answer the following: **14**
- (a) Explain locking/freezing in the flipping of cyclohexane with suitable examples.
 - (b) Explain conformations of bridged compounds with suitable examples.
- 8** Answer the following: **14**
- (a) Discuss variation in coupling constant with respect to the size of the ring.
 - (b) Write Karplus equation and mention Bothner modification for the calculation of 3J -coupling and discuss in detail with Karplus curve.
- 9** Answer the following: **14**
- (a) Explain stereospecificity and stereoselectivity with suitable examples.
 - (b) Explain the Exo-endo attack on bridged compounds with suitable examples.
- 10** Answer the following: **14**
- (a) Explain the Stereochemistry of Elimination reactions with suitable examples.
 - (b) Explain ORD and CD spectrum and discuss the CD spectrophotometer.
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