

**PARUL UNIVERSITY**  
**PARUL INSTITUTE OF APPLIED SCIENCES**  
**MID SEMESTER INTERNAL EXAMINATION, FEBRUARY 2019**  
**M. Sc. Chemistry Semester IV**

**Paper Name: Stereochemistry and Disconnection approach**

**Date: 26/02/2019**

**Paper Code: 11205252**

**Time: 1hr 30min**

**Max. Marks: 40**

**Instructions:**

1. All questions are compulsory and options are given in first and second question only.
  2. Numbers to the right of question indicate the marks of respective question.
- 

- Q. 1** Attempt any one question of the following. **(08)**
- a. What are different approaches to achieve asymmetric synthesis? Briefly describe any two approaches.
  - b. What are the different methods of resolution available? Explain any two methods with example.
- Q. 2** Attempt any three questions of the following. **(12)**
- a. What is racemic modification? How it can be achieved?
  - b. Explain optical inactivity by internal compensation with an example?
  - c. Why propane is more stable in staggered condition while propene prefers eclipsed condition?
  - d. Differentiate between enantiomers and diastereomers with example.
  - e. Give one example of Curtin–Hammett principle.
- Q. 3** Do as directed. Attempt all five questions. **(05)**
- a. Give one example of conformationally rigid diastereomers?
  - b. What is epimerization?
  - c. Explain the concept called angle strain with example?
  - d. What are axial and equatorial hydrogen?
  - e. What are Regiospecific reactions?
- Q. 4** Write correct option for THE following 15 multiple choice questions. **(15)**
- 1 In enantioselective synthesis,  
(A) Products are formed in equal amounts      (B) Products are formed in unequal amounts  
(C) Only one product is formed      (D) More than two products are formed.
  - 2 Racemization is process of converting an optically active compound into  
(A) Optically inactive compound      (B) Diastereomers  
(C) Racemic modification      (D) Pseudo-racemic compound
  - 3 For a compound containing 3 chiral centers, number of optical isomers are  
(A) 4      (B) 6  
(C) 8      (D) 12
  - 4 Meso-tartaric acid  
(A) Is Optically inactive      (B) Possesses a plane of symmetry  
(C) Is Optically active      (D) Both A and B.

- 5 Optical inactivity by internal compensation is shown by  
(A) Meso tartaric acid (B) D-tartaric acid  
(C) L-tartaric acid (D) D,L-tartaric acid
- 6 The energy of interaction between eclipsing two methyl groups is about  
(A) 2.1 kcal/mol (B) 3.1 kcal/mol  
(C) 1.5 kcal/mol (D) 0.5 kcal/mol
- 7 Bulkiest substituted group in chair conformation of a six-membered ring prefer  
(A) Axial position (B) Equatorial position  
(C) Depends on other substituents (D) No preference
- 8 Decalin has two fused rings made of  
(A) Cyclobutane and Cyclohexane (B) Two cyclobutane rings  
(C) Two cyclopentane rings (D) Two cyclohexane rings
- 9 Disconnection approach is also known as  
(A) Retrosynthesis (B) Retroanalysis  
(C) Interconversion (D) Rearrangement
- 10 Angular strain theory was proposed by  
(A) Dalton (B) Bayer  
(C) Huckel (D) Maxwell
- 11 In chair conformation of cyclohexane, types of C-H bonds are of  
(A) 2 types (B) 3 types  
(C) 4 types (D) 6 types
- 12 In cyclopentane ring, number of axial and equatorial Hydrogens (Hs) are  
(A) 5 axial and 5 equatorial (B) 4 axial and 6 equatorial  
(C) 6 axial and 4 equatorial (D) No axial and equatorial Hs
- 13 In cyclopentane ring, number of "endo" carbons are  
(A) 1 (B) 2  
(C) 3 (D) 4
- 14 It is said to be conformationally locked because it can't undergo a ring flip.  
(A) *cis*-Decalin (B) *trans*-Decalin  
(C) Both (D) None of the two
- 15 The meso form of an optical isomer is  
(A) Optically inactive. (B) a diastereomer of active forms  
(C) Same as D,L- form (D) Both A and B are correct