

**PARUL UNIVERSITY**  
**FACULTY OF APPLIED SCIENCE**  
**M.Sc. Summer 2022-23 Examination**

**Semester: 4**  
**Subject Code: 11205252**  
**Subject Name: Stereochemistry and Disconnection Approach**

**Date: 22-03-2023**  
**Time: 2:00pm to 4:30pm**  
**Total Marks: 60**

**Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

**Q.1. A) Essay type (Each of 04 marks) (08)**

- (a) Define resolution and discuss its types.
- (b) Explain substrate control in acyclic hydrogenation reaction.

**Q.1. B) Answer the following questions (Any two)**

- (a) Short note (Each of 02 marks) (04)
  1. Differentiate between enantiomers and diastereomers. (four points)
  2. Give the reaction for reagent control hydroboration reaction.
- (b) Explain mechanism of hydroboration reaction? (04)
- (c) Explain the mechanism of catalytic enantioselective reduction (04)

**Q.2. A) Answer the following questions.**

- (a) Short note (Each of 02 marks) (04)
  1. Discuss E2 elimination of cyclohexyl tosylate.
  2. Give one example of conformationally rigid and mobile diastereomers.
- (b) Explain Curtin–Hammett principle giving example of Quaternisation of Tropanes. (04)

**Q.2. B) Answer the following questions (Any two)**

- (a) Do as directed. (Each of 01 marks) (03)
  1. Lewis acids are electron ..... groups.
  2. Full form of THF is .....
  3. Hydroboration-Oxidation of carbonyl compounds results in ..... formation.
- (b) Discuss mechanism of epoxide formation. (03)
- (d) Discuss neighboring group participation in cyclic systems. (03)

**Q.3. A) Essay type (Each of 04 marks) (08)**

- (a) Write a note on Diels-Alder reaction and valid disconnection on the reaction product.
- (b) Discuss disconnection on a 1,5- and 1,6- Dicarbonyl compounds.

**Q.3. B) Answer the following questions (Any two)**

- (a) Do as directed. (04)
  1. Find the suitable synthons and synthetic equivalents after disconnection.



2. Find the suitable synthons and synthetic equivalents after disconnection.



(b) Perform a valid disconnection for  $\alpha,\beta$ -unsaturated carbonyl compounds (04)

(c) Explain functional group Interconversion with suitable example. (04)

**Q.4. A) Answer the following questions.**

(a) Short note (Each of 02 marks) (04)

1. What is an activating group? Give one example.
2. Differentiate between the terms Regioselective and Regiospecific reactions.

(b) Disconnect phenyl acetic acid and synthesize it as per the formed synthons. (04)

**Q.4. B) Answer the following questions (Any two)**

(a) Short note (Each of 01 marks) (03)

1. Transforming a target molecule into simpler precursor structures

- (A) Retroanalysis (B) Retrosynthesis (C) Disconnection (D) Both B and C

2. Synthons are

- (A) Molecular fragments (B) Cations (C) Anions (D) Both B and C

3. If reaction dominantly occurs at one functional group

- (A) Chemoselective (B) Regioselective (C) Regiospecific (D) Both B and C

(b) Perform and discuss a valid disconnection on 3-hydroxy ester. (03)

(c) Do as directed

(1) Find the suitable synthons and synthetic equivalents after valid disconnection. (03)



(2) Find the reaction product

