

- (b) Draw structures of (2S,3S)-2-Bromo-3-chlorobutane and (2S,3R)-2-Bromo-3-chlorobutane. (2)

Roll No. ....

Total Pages : 4

**751102**

**March 2022**

**M.Sc. (Chem.) - I SEMESTER**

**Organic Chemistry (General-I) (CH-102B)**

6. (a) Define the following terms :

(i) Diastereomers.

(ii) Anomers.

(iii) Chirality.

(iv) Chiral axis.

(v) Chiral plane. (3)

- (b) Draw all possible conformers of cis-2-decalol and give their relative stabilities. (2)
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Time : 90 Minutes]

[Max. Marks : 25

*Instructions :*

1. *It is compulsory to answer all the questions (1 mark each) of Part-A in short.*
2. *Answer any Three questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

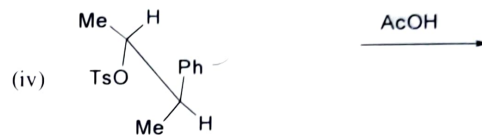
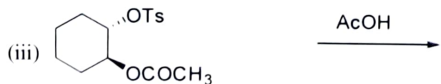
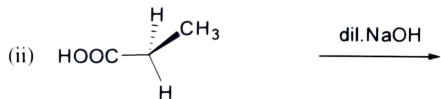
**PART-A**

1. (a) Write down applications of Hammond's Postulate in organic chemistry. (1)
- (b) Draw energy profile diagram for two step reaction having both steps endothermic. (1)
- (c) Discuss the symmetry properties of LUMO of cyclopentadienyl anion. (1)
- (d) Briefly explain non-classical carbocation giving suitable example. (1)

- (e) Explain hybridization and geometry of ethyl free radical. (1)
- (f) Briefly explain Hammett Equation. (1)
- (g) Explain the chirality of 3-membered cyclic alkanes. (1)
- (h) What do you understand by rotation reflection axis of symmetry? (1)
- (i) What do you understand by atropisomerism? (1)
- (j) Explain stereochemistry of cis-1,2-dichloro-cyclohexane. (1)

### PART-B

2. Complete any *three* of the following reactions giving detailed mechanism and suitable explanation wherever required. (5)



3. (a) What do you understand by isotope labelling? How is it different from isotope effect? Explain the role of each in determining organic reaction mechanism. (3)
- (b) Explain the stereochemistry of  $S_N1$ ,  $S_N2$ ,  $S_Ni$  and ion pair mechanism. (2)
4. Explain different methods of determining organic reaction mechanism. (5)
5. (a) Assign the following structures as Erythro and Threo: (3)

