

M.Sc.(Chem.) Semester - 3 (CBCS) Examination

DEC/JAN. - 2020 - [NEW COURSE]

Stereochemistry (Core (New))

Time: 1:30 Hours

Marks: 42

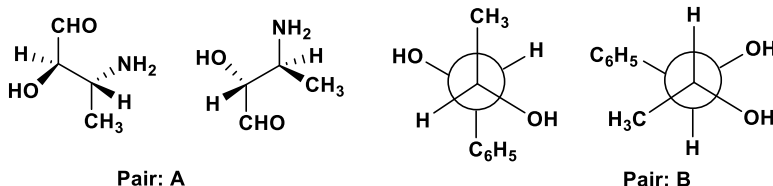
Instructions:

1. Figure to the right indicate marks.
2. There are five questions in the question paper.
3. Answer any three of the following questions.

Q.1 (A) Answer the following

4

- (1) (a) What is Chirality? Discuss the effect of chirality on biological properties of molecules with any two examples.
(b) Differentiate between Enantiomers & Diastereomers with example.
- (2) Assign absolute configuration at each stereocenter and Identify stereoisomeric relationship among following pairs:



Q.1 (B) Answer any two question out of three.

10

- (1) (a) Discuss the resolution of racemic mixture via Chiral resolving agents with suitable example.
(b) Justify the statement with suitable example: One group exchange across the stereocenter inverse the configuration.
- (2) (a) Draw (2S,3S)-2-cyano-3-phenylbutanal in staggered wedge- dash projection and convert it into Fischer, Newman and Sawhorse projection
(b) What is enantiomeric excess (ee)? In A stereoisomeric mixture of ibuprofen contains ee of (R) is 80%. Calculate the % amount of (R) and (S) stereoisomer in the mixture.
- (3) (a) What is Axial chirality? Discuss with suitable examples.
(b) Discuss geometrical and optical isomerism in cyclooctene.

Q.2 (A) Answer the following

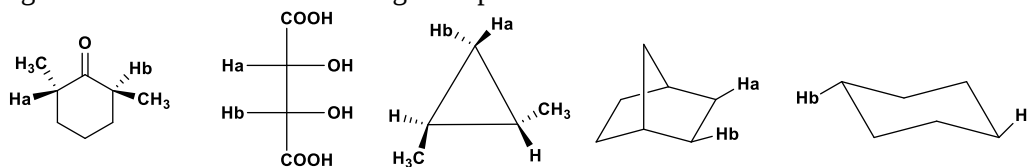
4

- (1) Explain Re-Si nomenclature system for C=O face with suitable example.
- (2) Draw (a) eclipsed conformation and (b) bisecting conformation for propionaldehyde and discuss its stability.

Q.2 (B) Answer any two question out of three.

10

- (1) What is Pro-Chirality? Identify the topicity (homotopic, enantio-topic or diastereotopic) of ligand Ha and Hb in the following examples:



- (2) Explain stability of conformers of (a) halo alkanes and (b) 1,2 diols with suitable examples
- (3) Discuss klyne-prelog terminology for conformational analysis.

Q.3 (A) Answer the following

4

- (1) Discuss the stability order for following cyclohexane conformers and justify your answer:
(a) Chair (b) Half chair (c) Boat (d) Twisted boat
- (2) Give exo & endo nomenclature for Bicyclo[2,2,1] heptane.

Q.3 (B) Answer any two question out of three.

10

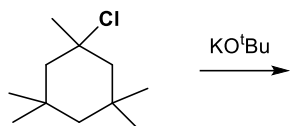
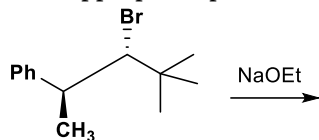
- (1) Discuss anomeric effect and mutarotation in D glucose.
- (2) Describe conformational isomerism in the N-methyl piperidine.
- (3) Describe conformational analysis of 1,2 and 1,3 dimethyl cyclohexane.

Q.4 (a) Answer the following**4**

- (1) What product will form when neo-Menthylchloride react with NaOEt. Justify your answer
- (2) Discuss the effect of nucleophile and solvent in S_N^2 reaction.

Q.4 (b) Answer any two question out of three.**10**

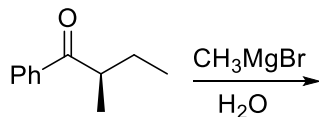
- (1) What is anchimeric assistance? Discuss anchimeric assistance of OH and σ -bond with suitable examples.
- (2) Discuss syn and Anti elimination with suitable examples.
- (3) Give appropriate product for following two reaction sequence. Explain its mechanism.

**Q.5 (a) Answer the following****4**

- (1) Show with suitable example that hydroboration-oxidation is a syn and anti-markovnikov addition reaction.
- (2) Discuss at least two dihydroxylation reagents with their stereoselective mechanism.

Q.5 (b) Answer any two question out of three.**10**

- (1) Describe stereoselectivity of following metal hydride reagents on 4-tert-butylcyclohexanone. Justify your answer.
 - (a) $LiAlH_4$
 - (b) L-selectride
- (2) Predict the product with diastereoselectivity for the following reaction using Felkin-Ahn model.



- (3) Complete the following reaction sequence with mechanism:

