**647510** **MSC3OrgC301x** **Seat No :_____**

# M.Sc.(Chem.) Semester - 3 (*CBCS*) Examination
## Oct/Nov. -2019 - [NEW COURSE]
## Stereochemistry (Core (New))

**Time: 2:30 Hours** **Marks: 70**

**Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate marks.

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### UNIT-1 (14 marks)

Answer **ALL** questions

**Q.1 (a) Answer the following** **4 Marks**

(1) Discuss (i) Chirality (ii) Asymmetric center (iii) enantiomeric excess(ee).

(2) Why meso-compounds are optically inactive ? Explain with example.

**Q.1 (b) Answer any two question out of three.** **10 Marks**

(1) Discuss following methods for racemic modifications:
(a)Diastereomers formation
(b) Enzymatic reaction

(2) Draw (2S,3R)-2-methyl-3-phenylbutanal in staggered wedge-dash projection and convert it into Fischer, Newman and Sawhorse projection.

(3) What is axial chirality ? Discuss with suitable examples.

### UNIT-2 (14 marks)

Answer **ALL** questions

**Q.2 (a) Answer the following** **4 Marks**

(1) What is torsional angle? Discuss klyne-prelog terminology for conformational analysis.

(2) Explain Re-Si nomenclature system for C=C faces.

**Q.2 (b) Answer any two question out of three.** **10 Marks**

(1) What is topicity of ligand? Discuss at least three heterotopic ligands with suitable examples.

(2) Explain conformation and reactivity of acyclic compounds with at least two examples.

(3) Describe enantiotopic and diasterotopic carbonyl faces with suitable examples.

### UNIT-3 (14 marks)

Answer **ALL** questions

**Q.3 (a) Answer the following** **4 Marks**

(1) Give exo & endo nomenclature for Bicyclo[2,2,1] heptane.

(2) Draw cis & trans decalin. Why cis decalin is optically inactive.

**Q.3 (b) Answer any two question out of three.** **10 Marks**

(1) Draw hawarth projection of α- & β-D-glucose and convert them into chair conformation. Explain mutaroation.

(2) Describe conformational isomerism in the N-methyl piperidine by pyramidal inversion and ring inversion.

(3) Explain chirality of various conformations of for 1,2 dimethyl and 1,3 dimethyl cyclohexanes.

## UNIT-4 (14 marks)

Answer **ALL** questions

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

(1) What product will form when Menthylchloride react with NaOEt. Justify your answer

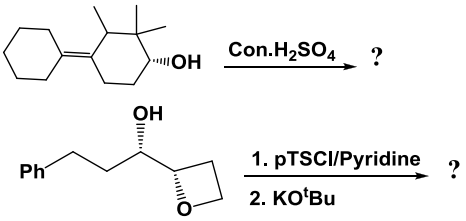
(2) Explain regioselectivity in the E1CB mechanism.

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

(1) What is anchimeric assistance? Discuss at least two examples.

(2) Why $SN^2$ reaction is always stereospecific as well as stereoselective? Explain with example.

(3) Give appropriate product for following two reaction sequence. Explain its mechanism.




## UNIT-5 (14 marks)

Answer **ALL** questions

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

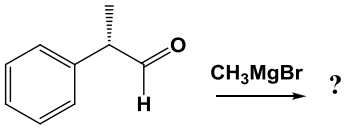
(1) Explain stereoselectivity of hydroboration-oxidation reaction on alkene with suitable example.

(2) Write the reaction mechanism of cis-dihyroxylation of olefins by $OsO_4$.

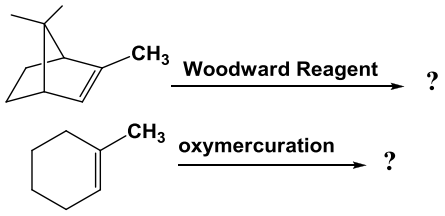
**Q.5 (b) Answer any two question out of three.** **10 Marks**

(1) Describe stereoselectivity of following metal hydride reagents on 4-tert-butylcyclohexanone. Justify your answer.
(a) $NaBH_4$
(b) $LiAlH_4$
(c)L-selectride

(2) Predict the diastereoselctivity of the following reaction using Felkin-Ahn model and write corresponding product.




(3) Complete the following reaction sequence with mechanism:

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