

Birla Institute of Technology & Science, Pilani
Pilani Campus, Rajasthan - 333 031

II Semester 2016-2017, Mid-term exam

Course: CHEM C243

Course Title: Organic Chemistry-II

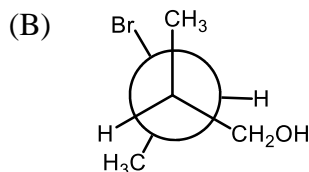
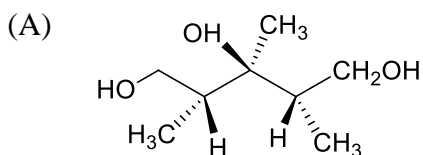
Time: 90 min.

Max. Marks: 60

Instruction to students: **Close book**, answer all questions and answer all parts of a question together

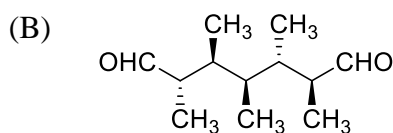
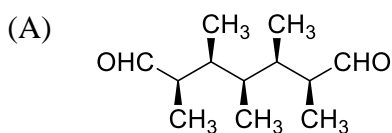
Q. 1 Convert following conformations into Fischer formulas.

4.0



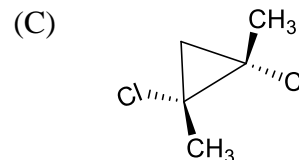
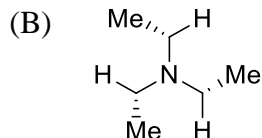
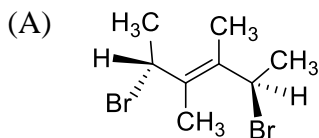
Q. 2 In the compounds given below, label C-4 as chirotopic or achirotopic. Provide appropriate notation (R, S, *r* or *s*) for the stereogenic C-4.

3.0



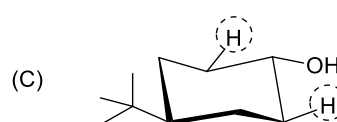
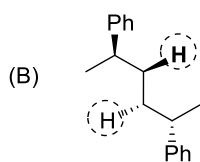
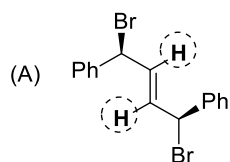
Q. 3 Identify symmetry elements present in the following molecules and comment on their chirality.

4.5



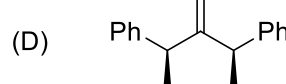
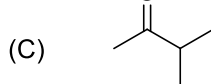
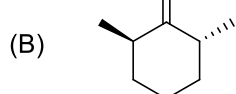
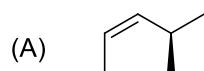
Q. 4 Identify the pair of hydrogens (circled) in each molecule below as homotopic, enantiotopic, or diastereotopic. Wherever applicable, label these hydrogens as *pro-R* or *pro-S*.

4.5



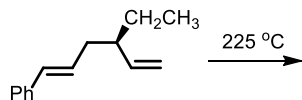
Q. 5 Determine whether the two faces of the olefin or carbonyl in the molecules given below are homotopic, enantiotopic, or diastereotopic.

4.0



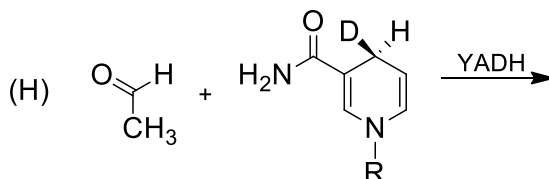
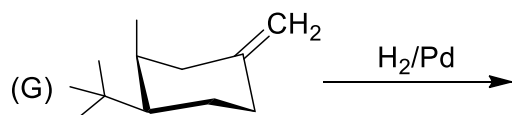
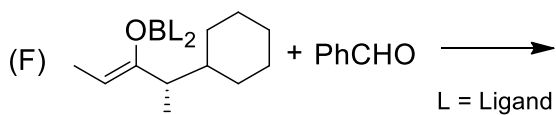
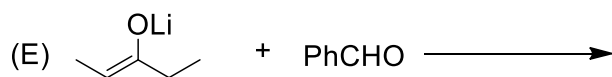
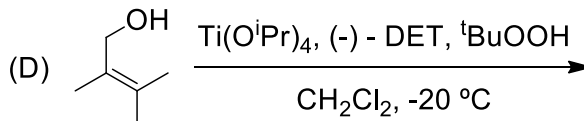
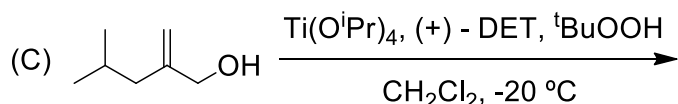
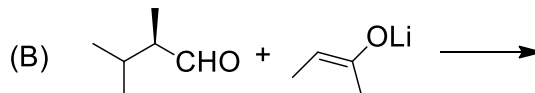
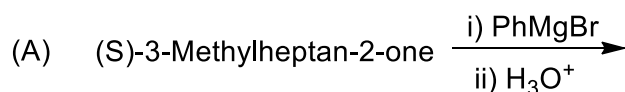
Q. 6 Identify the major product(s) of the following sigmatropic rearrangement.

3.0



Q. 7 Write the major stereoisomer(s) obtained in each of the following reactions.

16.0



Q. 8 The reaction of optically active 3,3-dimethylbutan-2-ol with racemic 2-phenylbutyric anhydride gives (R)-(-)-2-phenylbutyric acid as residual acid. Write structure of alcohol in Fischer formula. 4.0

Q. 9 Write the structure of the acid in Fischer formula which is formed when ester of PhCOCO₂H and (R)-4-methylpentan-2-ol is reacted with CH₃MgBr followed by hydrolysis. 4.0

Q. 10 (a) Write Newman projection (staggered) for the product obtained by reaction of (S)-3-chloro-3,4-dimethyl-pentan-2-one with CH₃MgBr followed by hydrolysis. 4.0

(b) Write the stereochemical structure of the reaction of product obtained in part (a) with zinc. 2.0

Q. 11 (R)-(+)-1-Phenylethyl chloride is heterofacial with (-)-1-Phenylethyl amine, write chemical reactions to correlate their configuration. 3.0

Q. 12. Show by suitable chemical conversion that either displacement of chloro group by AgOH is homofacial and that by KOH is heterofacial or vice versa. 4.0

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