

Do not write anything on this question paper except your name and entry number

CML100 General Chemistry

Department of Chemistry, IIT Delhi, New Delhi 110 016

Exam: Major

Time: 8.00 to 10.00 a.m. (2 hours)

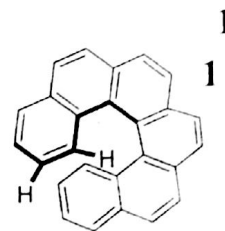
Day and Date: Sunday, November 22, 2015

Max. Marks: Forty six (46)

Name: _____ Entry No.: _____

Question 1(i): Draw Fischer projection formulas for all stereoisomers of 2,4-dimethyl-3-hexanol.

Question 1 (ii): Draw the enantiomer of the following chiral molecule.



Question 1(iii): Explain bonding, orbital structure and hybridization in allene, $\text{CH}_2=\text{C}=\text{CH}_2$.

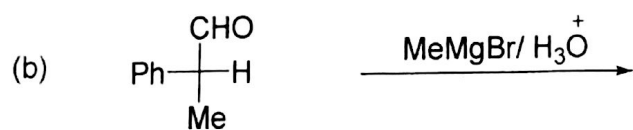
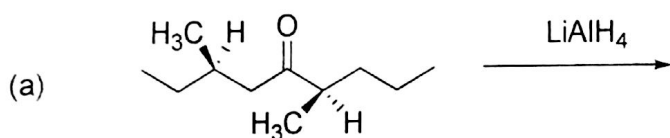
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Question 2 (i): (+) tartaric acid has a specific rotation of +12.0. Calculate the specific rotation of a mixture of 68% (+)-tartaric acid and 32% (-)-tartaric acid.

3

Question 2 (ii): Use Cram's rule to predict the configuration of the major product upon nucleophilic attack on the carbonyl group.

4

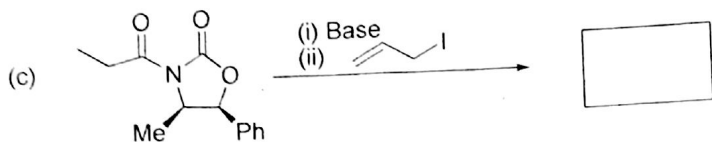
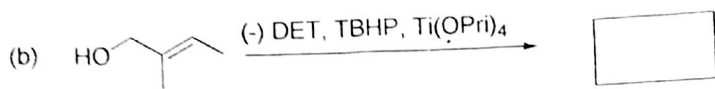
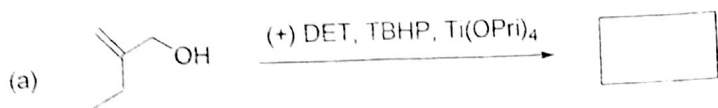


Question 3(i): What product will be obtained from the following enantioselective reactions.

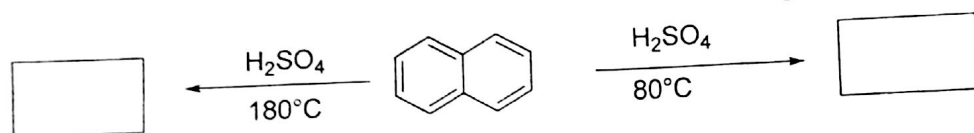
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Rh - 45
Re - 75

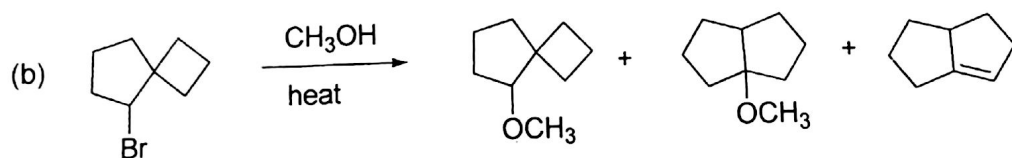
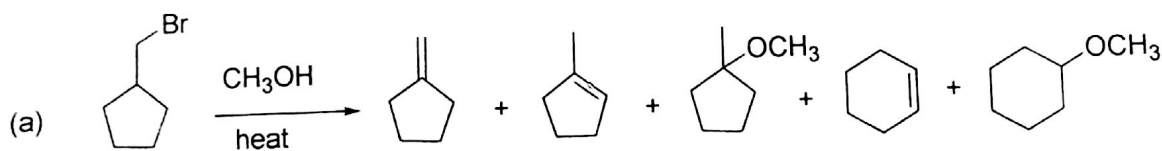
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Question 3 (ii): Write the product and energy diagram of the following transformation. 2



Question 4 (i): Solvolysis of following compounds in methanol gives a complex product mixture of the following five compounds. Propose mechanism to account for these compounds. 4 (2.5 + 1.5)



Question 4 (ii): For the following conversion, provide mechanism for the every product. 2

