

Mid-Semester Examination

March 16, 2016

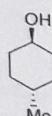
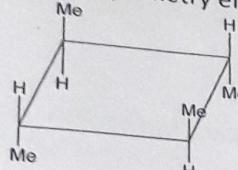
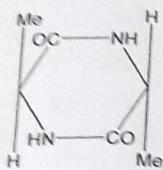
CHEM F243 Organic Chemistry-II

Max. Marks: 60

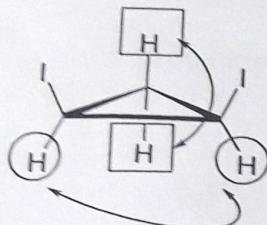
Time: 90 min

Q 1. Answer the followings

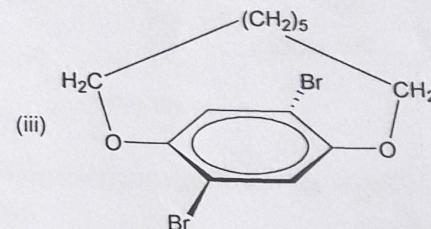
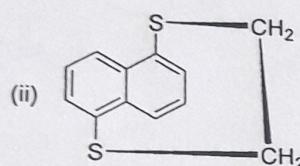
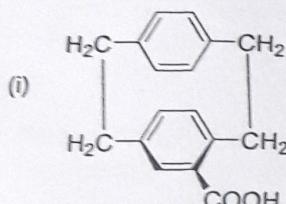
(A) Identify the compound(s) with symmetry elements  $S_n$  and  $i$  from the molecules given below. 3



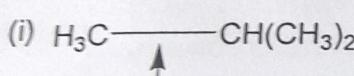
(B) Predict the acidity relationship between the marked protons. 3



(C) Give Rp or Sp descriptor for each of the following compounds. 6



(D) Considering rotation around the indicated bond in each compound, draw Newman projections for the most stable and least stable conformations. 4



(E) Identify most stable chair conformation of 1-methyl-1-phenylcyclohexane, explain. 4

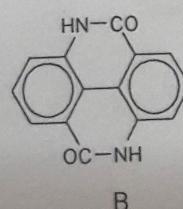
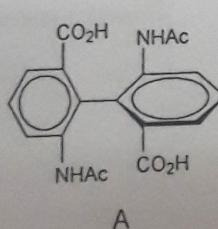
(F) Oxidation of trans isomer of 3,3,-dimethyl-5-methylcyclohexanol with chromic acid is faster than that of the cis isomer, explain. 3

(G) Draw the most stable chair conformation of the following molecules, and estimate the amount of strain in each (1,3-diaxial interaction in kJ/mol -Cl 1.0; Me 3.8; Et 4.0 ). 4

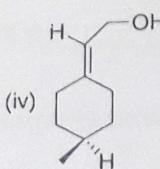
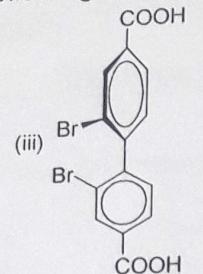
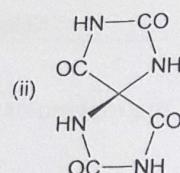
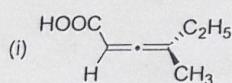
(i) trans-1-chloro-3-methylcyclohexane

(ii) cis-1-ethyl-2-methylcyclohexane

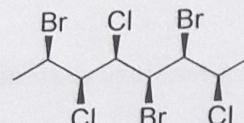
(H) On saponification, an optically active biphenyl derivative A gives a compound B. Comment on the optical activity of B. What is the configuration of A 4



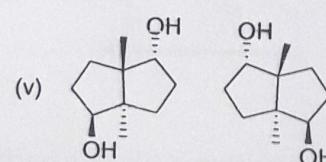
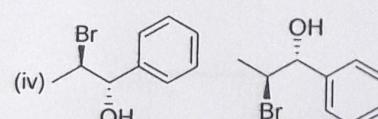
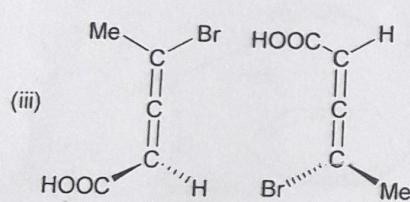
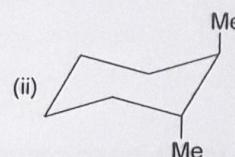
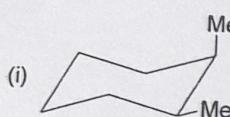
(I) Assign configuration (R/S/Ra/Sa) to the following compounds



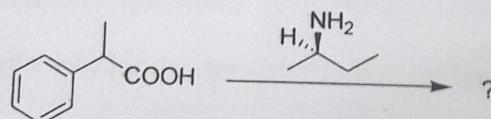
(J) Convert the given below Dashed wedge structure into Fischer projection.



Q 2 What is the stereochemical relationship (enantiomer, diastereomer, same, configuration and conformational) between each of the pairs given below?



Q 3 An acid-base reaction of R-sec-butylamine with a racemic mixture of 2-phenylpropanoic acid forms two products having different melting points and somewhat different solubilities. Draw the structures of these products. How are the two products related to each other (enantiomers, diastereomers, constitutional or not isomers)?



Q 4 Answer the following questions for the compounds X and Y.

(i) State whether the given compounds are optically active (chiral).

(ii) Is there any pseudo-asymmetric centre present in X or Y. If (Yes/No) indicate the pseudo-asymmetric centre in the structure and assign the stereochemistry?

