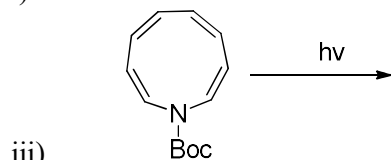
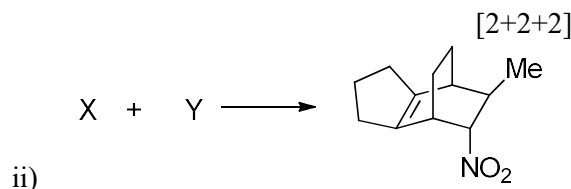
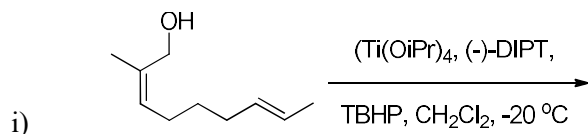
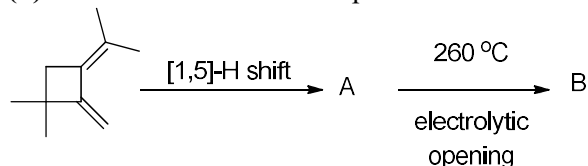


NOTE: Attempt answer for all parts of a question together.

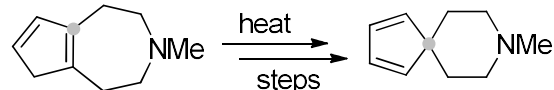
Q1. (a) Complete the given transformations. [2+2+2]



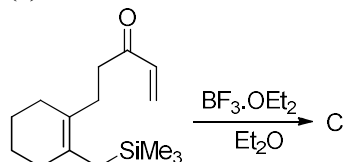
(b) Write the structure of the products A and B? [2+2]

Q2. (a) The observed rotation of an enantiomeric mixture of compound X is -97.5° , while the rotation of its pure enantiomer is -102.6° . Calculate the enantiomeric ratio (er) of X in the mixture. [3]

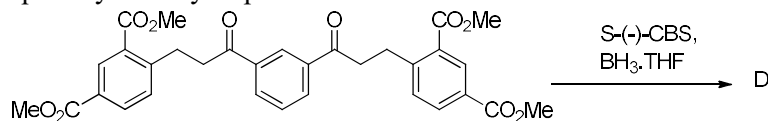
(b) Explain the stepwise conversion for the following transformation. [3]



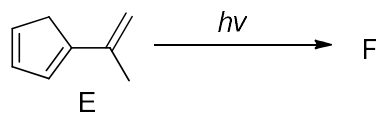
(c) Write the structure of the product C and explain its formation through stepwise reaction mechanism. [2+2]



Q3 (a) Write the structure of the product D with correct stereochemistry for the given transformation and comment of the optically active of product D. [2+1]

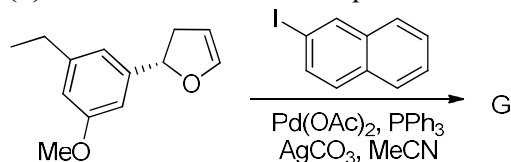


(b) Compound E easily converts to a more stable compound F (having permanent dipole moment) under photochemical conditions. Predict the structure of F and explain its formation. [2+1]



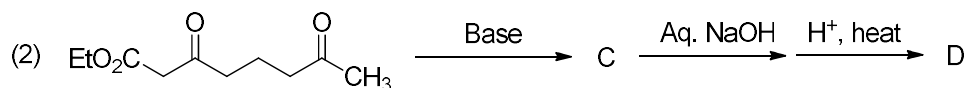
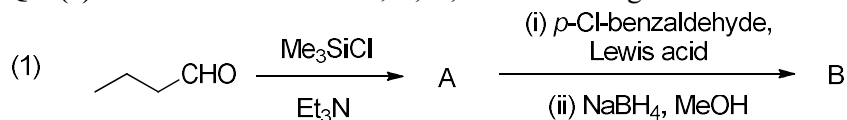
(c) Draw the LUMO of 1,3,5-hexatriene and assign the number of nodes. [2]

(d) Write the structure of the product G with correct stereochemistry? [2]

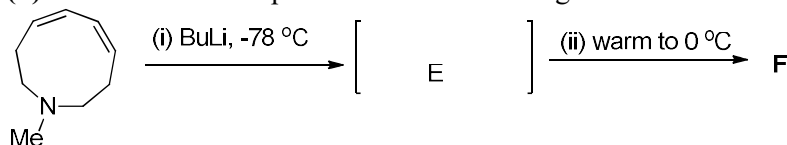


NOTE: Attempt answer for all parts of a question together.

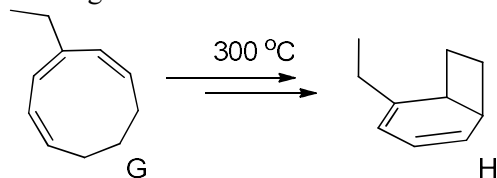
Q1. (a) Write the structure of A, B, C, and D for the given transformations. [1.5 X 4]



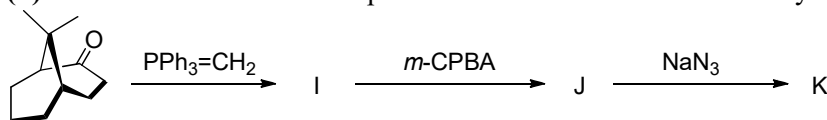
(b) Predict the correct product E and F for the given transformation and explain the conversion of E to F? [3+1]



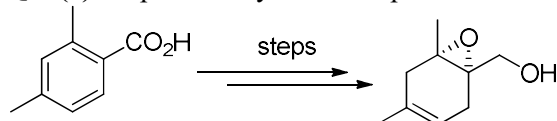
Q2 (a) Write the conversion of G to H in just two steps. Label the pericyclic process that took place. Three-dimensional drawings are recommended. [1+2+1]



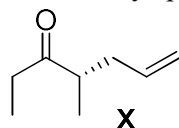
(b) Predict the structure of the products with correct stereochemistry? [2+2+2]



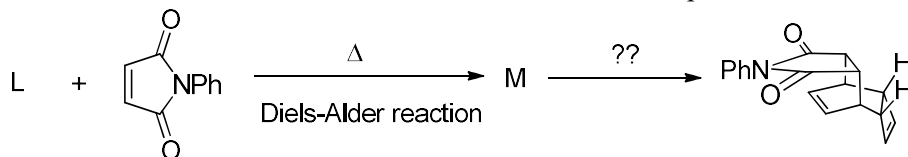
Q3. (a) Propose the synthetic steps with reaction condition for the following transformation? [6]



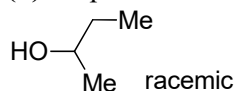
(b) Write all synthetic steps with proper reaction conditions to synthesize given compound (X) in asymmetric fashion from diethylacetone using chiral auxiliary approach. (Choose auxiliary and other reactants yourself) [4]



Q4. (a) Predict structures of L and M for the given transformations? Three-dimensional drawings are recommended. State the reaction conditions and mode of reaction in second step? [1+2+1]

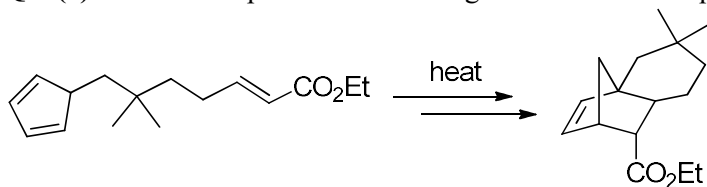


(b) Propose the resolution of given compound by the method of your choice. [4]

(c) Explain why *endo*-product is favored product over *exo*- in Diels-Alder reaction through transition state molecular orbital diagram. [2]

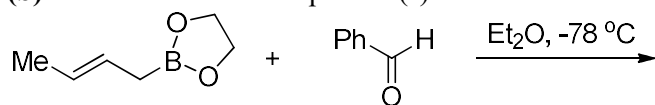
Q5. (a) Write the steps for the following transformation sequentially.

[4]



(b) Write the structure of product(s) with correct stereochemistry?

[1+1]



(c) Mentioning the steps, reagents and conditions, propose the synthesis of given compound N from given starting material (SM).

[4]

