1. (12) Give the I.U.P.A.C. names of the following compounds.

   a) 
   b) 
   c) 

2. (12) Provide complete mechanisms for the following reactions. Use arrows to indicate electron flow, show all intermediates and use only the reagents provided (or generated).

   a) 
   b)
3.(15) Provide a sequence of chemical steps (in order, separated by numbers) needed to carry out the following syntheses all starting from 3-hydroxycyclohexanone.

4.(12) Draw the structures of compounds A-D in the following synthesis:

A =

B =

C =

D =