Diels-Alder Reactions

1) Circle the better of the dienes in the pairs shown below?

a) ![Dienophile 1]  
   b) ![Dienophile 2]

2) Circle the better of the dienophiles in the pairs shown below?

a) ![Dienophile 1]  
   b) ![Dienophile 2]

3) Predict the products of the following Diels-Alder reactions. Include stereochemistry where appropriate.

a) ![Cyclopentadiene] + ![Dienophile 1]  
   b) ![Cyclopentadiene] + ![Dienophile 2]

c) Cyclopentadiene + CH$_2$=CH-COOCH$_3$

d) 1,3-cyclohexadiene + CH$_3$OOC-C≡C-COOCH$_3$
4) Show how Diels-Alder reactions might be used to synthesize the following compounds.

a) ![Diagram of compound a]

b) ![Diagram of compound b]

c) ![Diagram of compound c]