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## INDIAN INSTITUTE OF TECHNOLOGY, KHARAGPUR

**Date:** FN / AN      **Full Marks/Time:** 40/2 h      **Autumn Semester 2012-13**  
**No. of students:** 40 (1<sup>st</sup> yr of Joint MSc-PhD)      **Department:** Chemistry  
**Subject No/Name:** CY41011 / Principles of Organic Synthesis

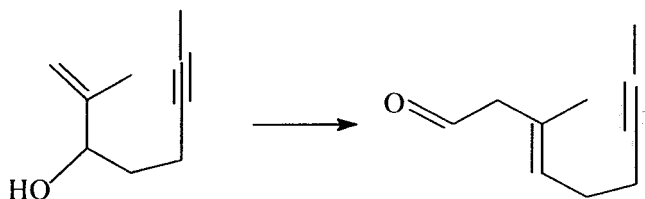
Answer all the questions.

1. Draw the 3d structures for the following conformers and show in them different steric interactions: (6)

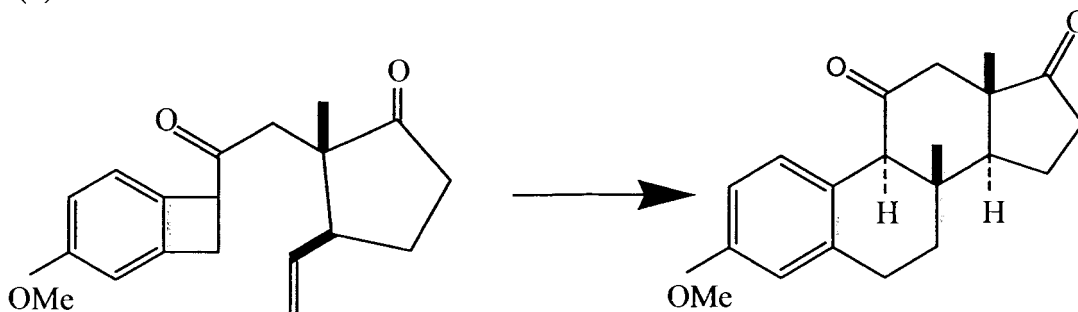
- (i) cis-transoid-cis perhydroanthracene
- (ii) trans-cisoid-cis perhydrophenanthrene
- (iii) 9,10- dimethyl cis decalin

2. How would you carry out the synthesis of the following compounds from the mentioned starting materials . Explain with reagents , steps and mechanisms: (6)

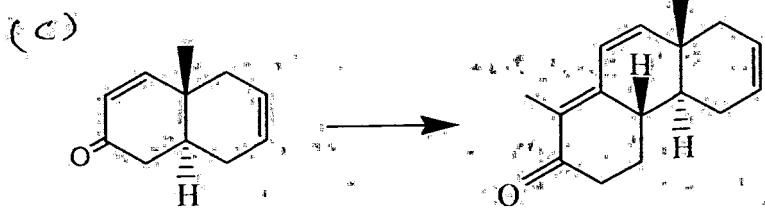
(a)



(b)

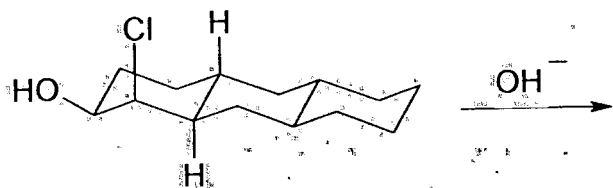


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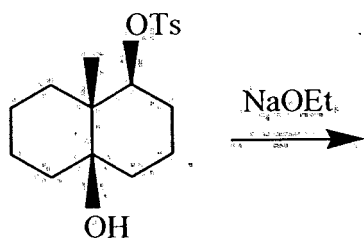


3. Give the products of the following reactions. Where more than one product is likely to be formed in significant yield, indicate which will be the major product and also predict the mechanism of the reaction involved. (8)

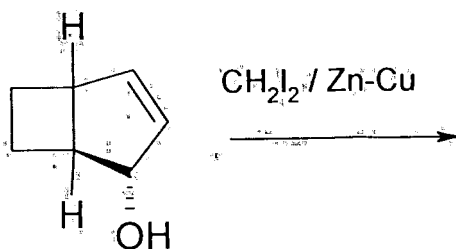
(a)



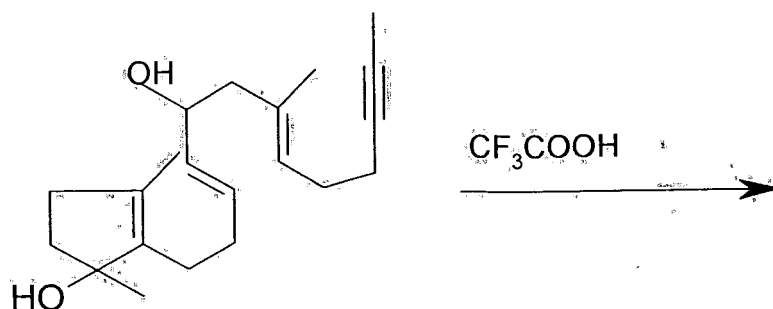
(b)



(c)



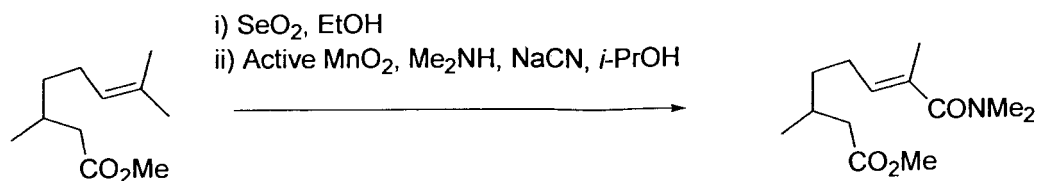
(d)



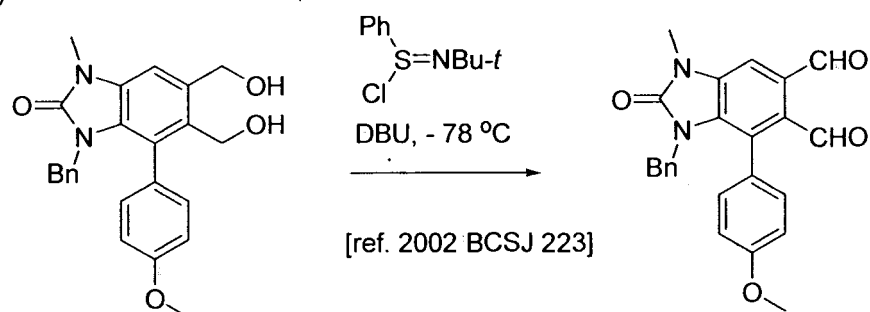
4. Propose an electron-arrow mechanism for the transformations given below.

[3 + 2 + 3 = 8]

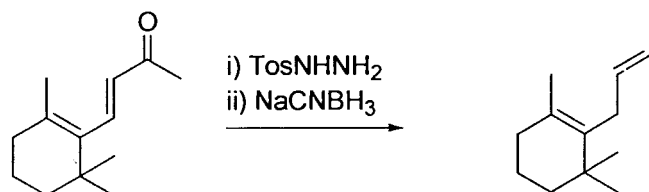
a)



b)



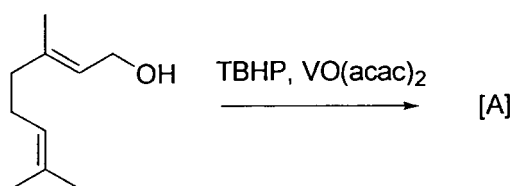
c)



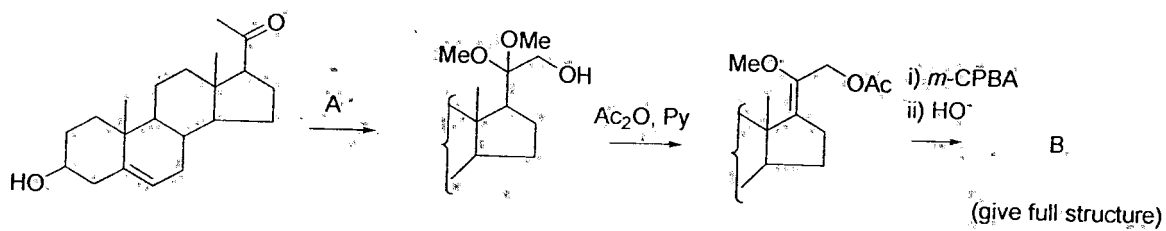
5. Suggest the structures of the missing products/reagents for each of the following transformations. Justify the answers. Specify the stereochemistry wherever applicable.

[2 + 4 + 4 + 2 = 12]

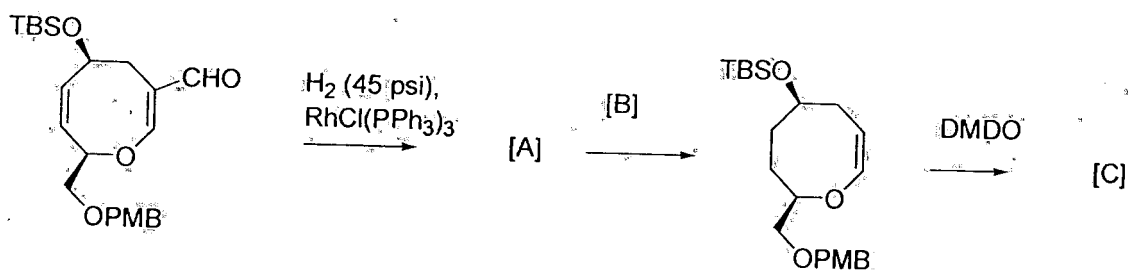
a)



b)



c)



Ans. can be found at 2002 OL 3891

d)

