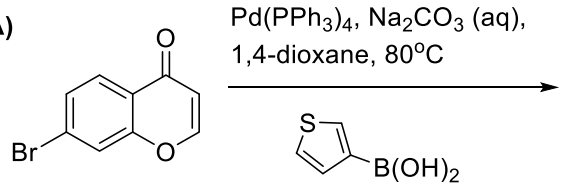
Organic Chemistry Cumulative Examination
2 February 2017

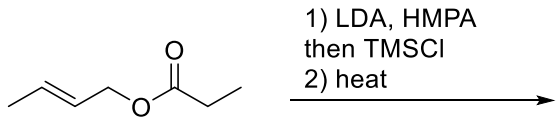
Total: **130 points**

1) **Give the products** of the following reactions and **draw any isolable intermediates**. Carefully indicate stereochemistry where appropriate (**30 points**).

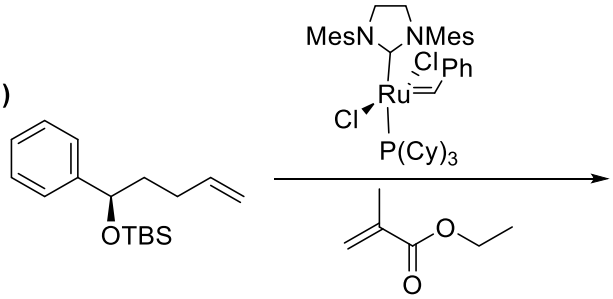
A)



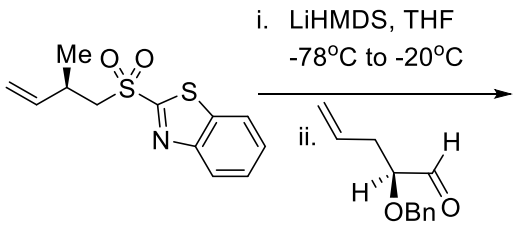
B)



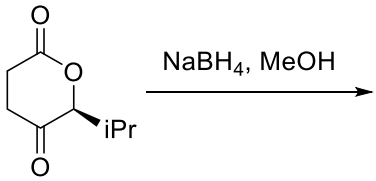
C)



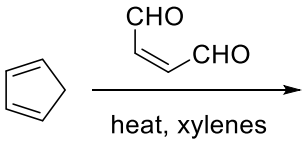
D)



E)

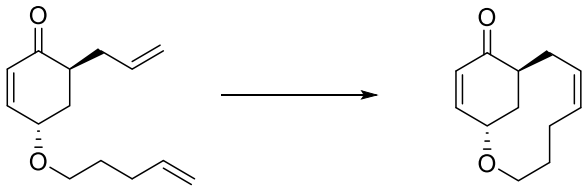


F)

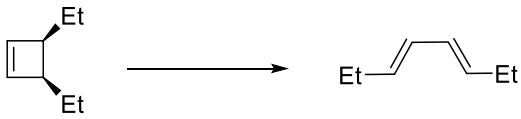


2) **Provide reaction conditions** to selectively effect the following transformations (**20 points**).

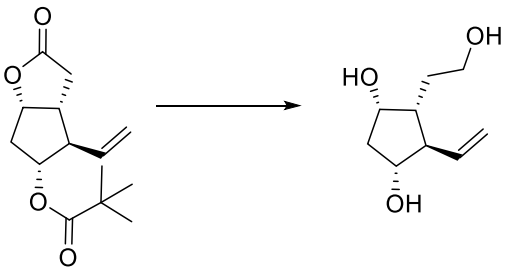
A)



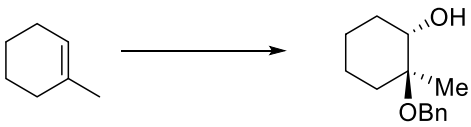
B)



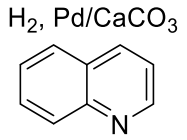
C)

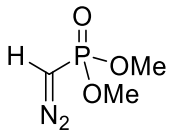


D)

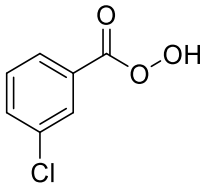


3) The following reagents are very useful for organic synthesis. **For each reagent, give its common name** (e.g. Wilkinson's catalyst, IBX, Swern Oxidation) **and an example of the reagent's use**. Select a substrate of your choice to best illustrate each transformation (**20 points**).

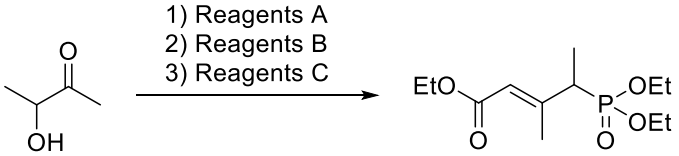


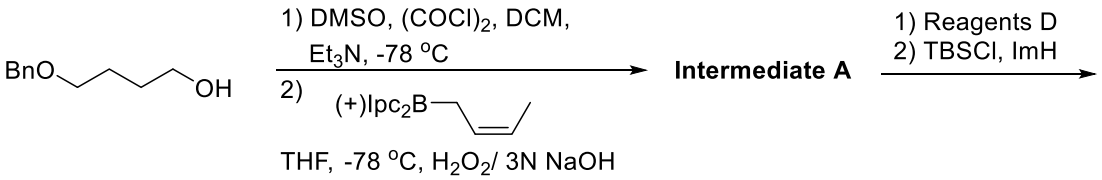


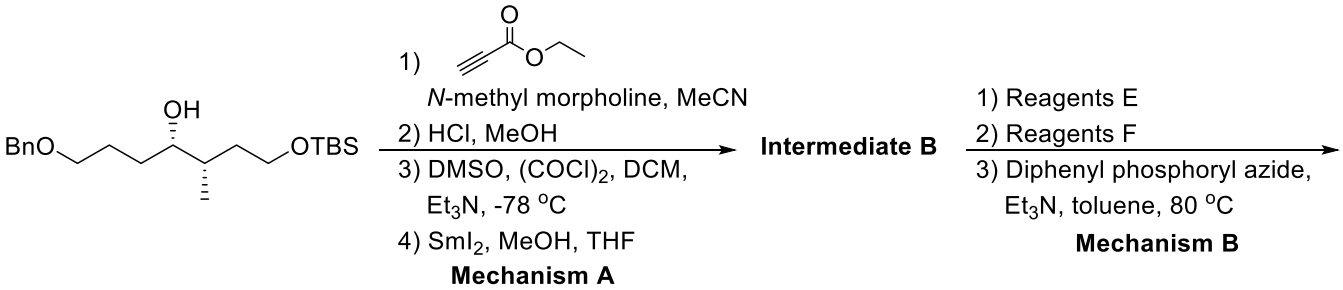
SO_3•pyr, Et_3N, DMSO

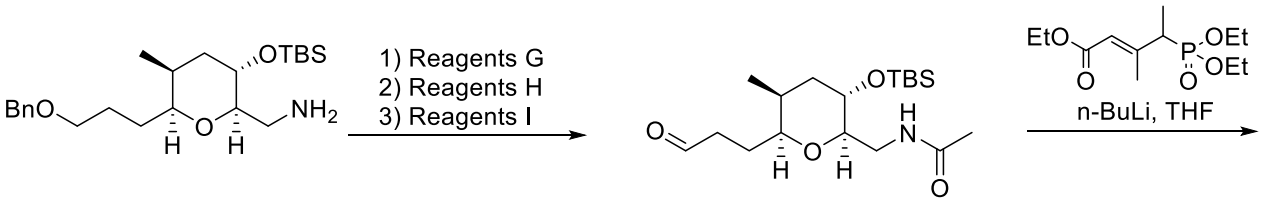


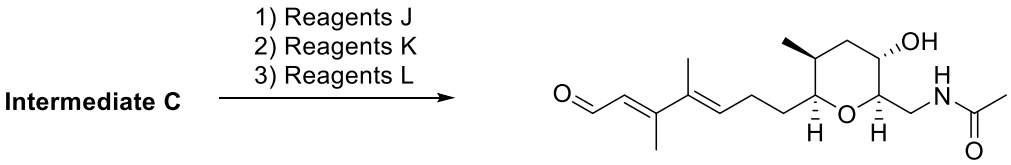
4) In the following synthetic route, **provide the missing reagents, intermediates, and mechanisms** as indicated (**40 points**).





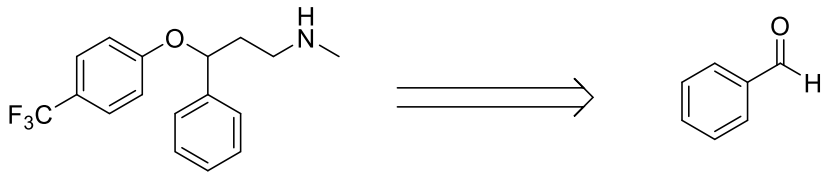






Please provide reasonable reaction mechanisms for the SmI_2 mediated transformation to give Intermediate B (Mechanism A) and the reaction invloving diphenyl phosphoryl azide (Mechanism B).

5) **Propose an efficient racemic synthesis of Prozac starting from benzaldehyde**. Hint: your synthesis should be less than 9 steps. (**20 points**).



Prozac