**Special Topics in Fine Chemicals 2008 1st Exam Student ID # Name**

*Total 100 points. Write your answers in the space provided. If you need more space, write on the back.*

1. (2 x 10 points) Answer the following questions related to the formation of enolates shown on the right side when Y = Et.

(a) Explain the reaction results and indicate which is a *Z* or *E* enolate with definition.

(b) Suggest how to improve the selectivity for each product, **A** or **B**, by changing the base. Rationalize your answer. Predict also the selectivity change either when Y = OEt or Y = NEt2.

2. (10 points) Propose the two reasonable mechanisms for the following reaction and explain why one of these mechanisms is not possible based on the Baldwin’s rule.



3. (6 x 5 points) Write the major product of each of the following reactions. It is not required to show the mechanism but indicate clearly the stereochemistry of the products where appropriate.













4. (4 x 10 points) Predict the major product of each of the following reactions and explain why. Indicate clearly the stereochemistry of the products where appropriate.









5. (Bonus 10 points) Explain with an example what the double diastereoselection is.