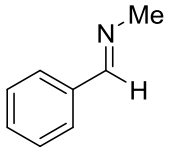
6941 Homework 1 (20 points). Due at the start of class on 9/12/16

Please answer the following questions on a separate sheet of paper. You may work together on all questions or individual questions, but you must state who you worked with. You also may use primary literature to aide you in your answers, but you must provide me with the reference that you used.

1) (10 points) Draw an orbital mixing diagram for the C=N double bond in the imine drawn below. Make sure your diagrams include drawings of the appropriately mixed orbitals at the appropriate energy levels. Although exact numerical values aren't necessary, I expect your diagram to be consistent with the energy differences between C and N; and sigma and pi bonds.



2) (10 points) The Sakurai-allylation (drawn below) can be simplified to the two-step mechanism drawn below. Please draw an energy diagram assuming step-1 is the fast step. Make sure to label all transition states, intermediates, E_a, and delta G's as appropriate.