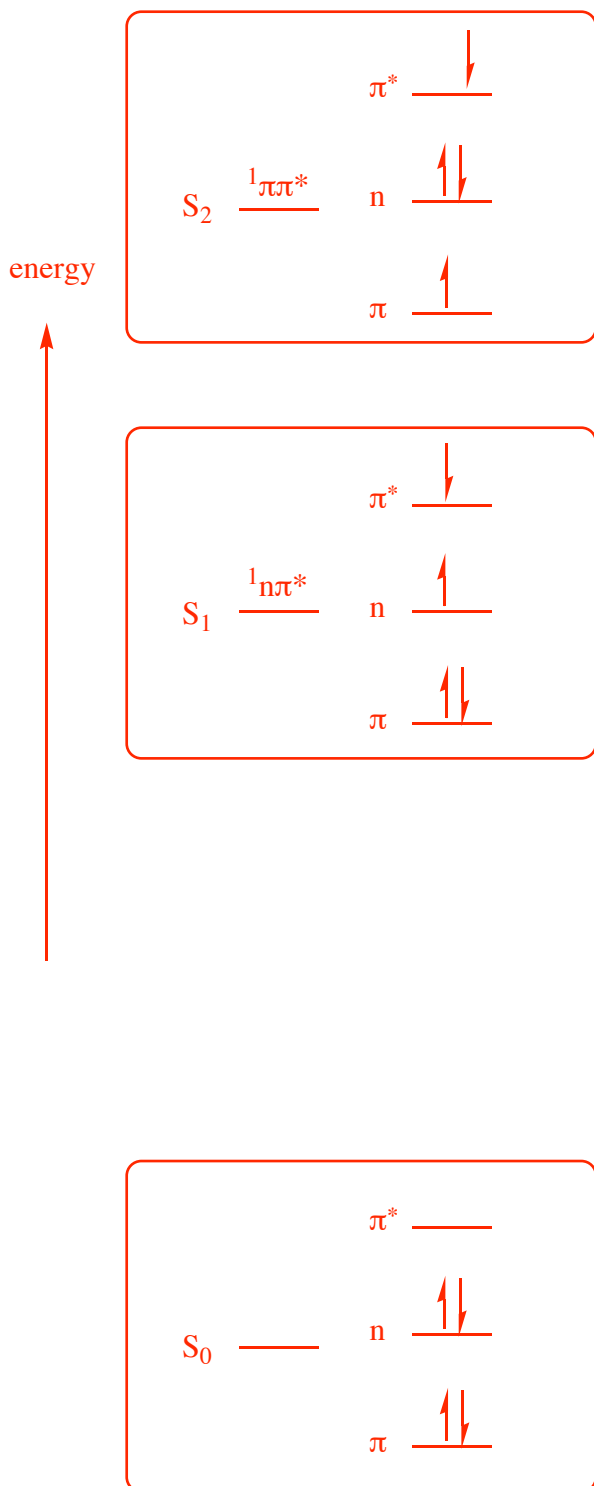
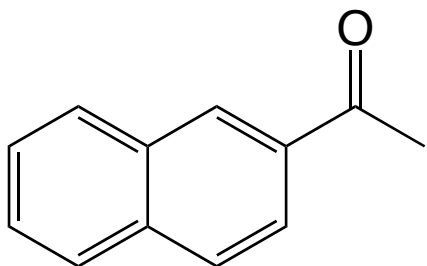


7. Using what we learned about related systems in class, for acetophenone shown below, give a diagram showing the relative energies of the S_0 , S_1 , S_2 , T_1 and T_2 states, and for each state, give an orbital/electron spin diagram. Label each state according to the normal notation, e.g. $^1\pi\pi^*$ etc.



If the $^3n\pi^*$ and $^3\pi\pi^*$ states in acetophenone are close in energy, and the $^3\pi\pi^*$ can be pushed below the $^3n\pi^*$ by the addition of a p-MeO donating group, then we would expect that the $^3\pi\pi^*$ state would also be pushed below the $^3n\pi^*$ state by extending conjugation to 2 rings from 1 ring.

