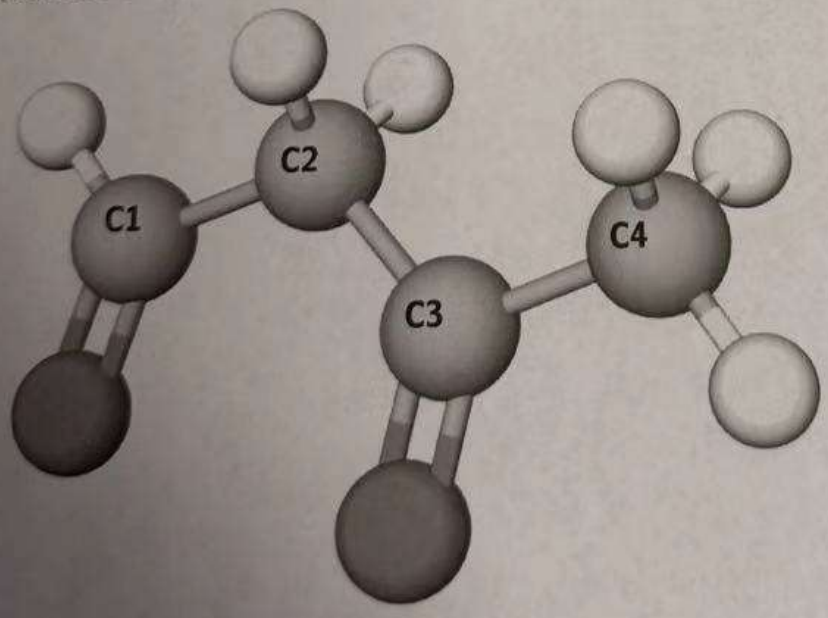
CHEM 112 Tutorial #8

Question 1 (***2 marks; 1 mark for each molecule***). Draw the Lewis structure and suggest a hybridisation scheme for the central carbon atom in each of the following molecules:

a) hydrogen cyanide (HCN)

b) Carbamic Acid (H_2NCOOH)

Question 2 (***4 marks; ½ mark for each carbon atom hybridizations and 2 marks for indicating orbital overlaps***). For the following compound, indicate the hybridization for all the central carbon atoms (labelled C1-C4) and show the orbital overlap for the bonds.



Question 3 (4 marks). For both C_2 and O_2^-:

a) Write the molecular orbital energy diagram (***1.25 marks for each molecule***).

b) Find the bond order and state whether the species is stable or unstable (***1 mark total***).

c) Determine if the species is diamagnetic or paramagnetic. If paramagnetic, indicate the number of unpaired electrons (***0.5 mark; 0.25 mark for each molecule***).