1) The work function of iron is 4.5 eV. You are able to produce the 3rd harmonics from the 800 nm line of a Ti:sapphire femtosecond laser (1 kHz repetition rate, 1 µJ/pulse, pulse duration 100 fs). What is the maximum kinectic energy of ejected photoelectrons? How would that number change if you double the power of the 3rd harmonics?

2) An electron in a quantum wire can be view in the first approximation as a particle in a one-dimensional box of length L. Derive the E1 selection rules for this electron.