Problem #7  
(a) Calculate the structure factor for GaAs which has the so-called “Zinc-blende” structure. It consists of two interpenetrating fcc lattices similar to the diamond structure: one fcc lattice contains Ga starting at the origin (0,0,0) and other fcc lattice contains As starting at (1/4, 1/4, 1/4 )a where a = 5.65Å is the lattice constant of the unit cell (containing 4 Ga and 4 As atoms). What are the different families of reflections expected?

(b) What are the Q values (in reciprocal angstroms) corresponding to the (002), (004) and (111) reflections?

(c) For neutron diffraction, what is the integrated intensity ratio of the (002) to the (004) reflection?

Problem #8 Problem 3.6 in the text book.