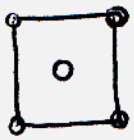
MSE/EE 5201 HW #1 Answers

1.9. (a)



# of atom $= 1 + 4 \times \frac{1}{4} = 2$

lattice constant $a =$

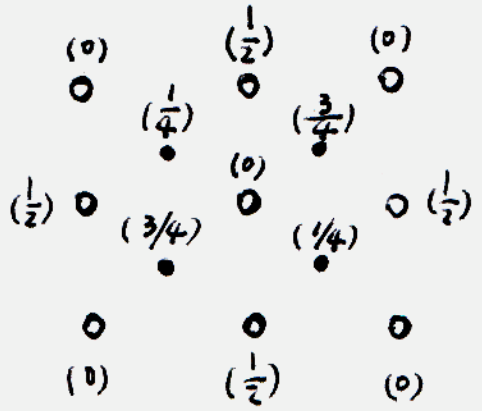
surface density $= \frac{2}{a^2} = 6.78 \times 10^{14}$ atoms/cm^2

(b) Fcc lattice

The nearest In neighbour distance is

$$\frac{\sqrt{2}}{2} a = \frac{\sqrt{2}}{2} \times 5.87 \text{ Å} = 4.15 \text{ Å}$$

1.11.



Top view of along the direction <100>

1.14. packing factor (f)

SC $f =$ 0.52

BCC $f = 0.68$

Diamond $f = 0.34$