



**Arab Academy for Science & Technology  
and Maritime Transport – Cairo Branch  
College of Engineering & technology  
Electronics & Communication Engineering Department**



**EC311 – Electronic Materials**

**Problem Set No.1: Revision**

**Duration: Week# 1**

**Physical Constants:**

**Avogadro's number ( $N_A$ ) =  $6.02 \times 10^{23}$  atoms/mol**

P1) Draw  $y$  vs.  $x$  for the relation  $y = A x + b$ . What is the slope? What does  $b$  represent?

P2) Draw the unit cell of SC, BCC and FCC lattices. Calculate  $n$  (the number of lattice points per unit cell).

P3) Aluminum (FCC structure) has a density of about  $2699 \text{ Kg/m}^3$ . Its atomic weight is  $26.97 \text{ g/mole}$ . About how many atoms contained in  $\text{m}^3$  of the solid?

P4) (a) What is the equivalent capacitance of a set of three capacitors having capacitances  $C_1$ ,  $C_2$  and  $C_3$  connected in series?

(b) What is the equivalent capacitance of a set of three capacitors having capacitances  $C_1$ ,  $C_2$  and  $C_3$  connected in parallel?

P5) An ac source,  $v$  is connected to the parallel connection of a resistor having resistance  $R$  and a capacitor having capacitance  $C$  and a current  $i$  passes in the circuit. Calculate the admittance, the power delivered by the source, the power dissipated in the resistor and the power stored in the capacitor.