1. How many electron must be removed from an electrically neutral silver ball to give it a charge of +2.4μC ?
(Ans : 1.5 x 10^{13} electrons)

2. Excess electrons are placed on a small lead sphere with mass 8.00g so that the net charge is –3.20 X 10^{-9}C. Find the number of excess electrons on the sphere
(Ans : 2.0 X 10^{10} numbers of electron)

3. Two isolated small objects have charges of 1.0 μC and –2.0μ C and are 50cm apart as Figure 3.5. What will be the magnitude of electrostatic force acting on each object? Write the electrostatic force vector component for each object.

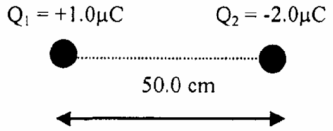

Figure 3.5

(Ans : 0.072N, $\vec{F}_{12} = +0.072\hat{i}$, $\vec{F}_{21} = -0.072\hat{i}$)

4. Three point charges are arranged as Figure 3.6. Find the resultant electric force vector component on the charge q_3 due to charge q_2 and q_1.

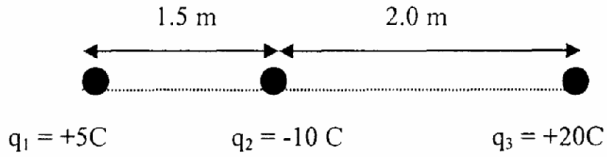

Figure 3.6

(Ans : $\vec{F}_3 = -3.765\times10^{11} iN$)

5. Three point charges Q_1 , Q_2 and Q_3 are arranged as shown in Figure 3.7
(i) Write the vector component for resultant force on charge Q_3 due to other charges
(ii) Calculate the resultant force on charge Q_3.

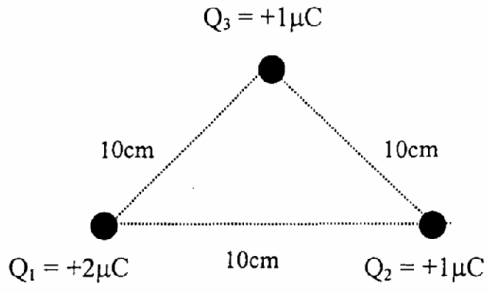

Figure 3.7

[Ans : i. $\vec{F}_3 = 0.45\hat{i} + 2.34\hat{j}$, ii. 2.38N, 79.1^0 ($1^{st}$ quarter)]

6. Three point charges Q_1 , Q_2 and Q_3 are arranged as shown in Figure 3.8 .
   (i) Find the vector component for resultant force on charge $Q_2 = +200\mu C$ due to other two charges.
   (ii) Calculate the resultant force on charge Q_2. .

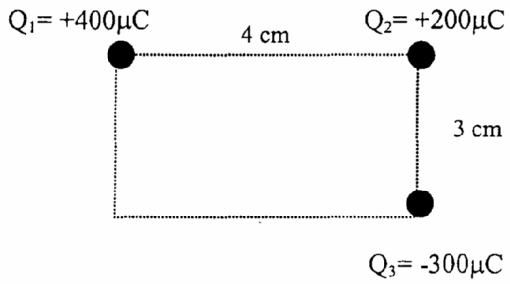

Figure 3.8

(Ans: i. 4.5×10^5 N $\boldsymbol{i} - 6 \times 10^5$ N $\boldsymbol{j}$, ii. 7.5×10^5 N, 53^0, 4^{th} quarter)

7. Two point charges Q_1 and Q_2 are 3m apart and repel each other with a force 0.075N. If $Q_1 + Q_2 = 20\mu C$, what is the charge on Q_1 and Q_2 .
(Ans: $5\mu C$, $15\mu C$)

8. Four point charges Q_1 , Q_2 , Q_3 and Q_4 are arranged as shown in Figure 3.9,
   (a) find the vector component for the force acting on Q_2 due to Q_1.
   (b) find the vector component for the force acting on Q_2 due to Q_3.
   (c) find the vector component for the force acting on Q_2 due to Q_4
   (d) find the force acting on Q_2

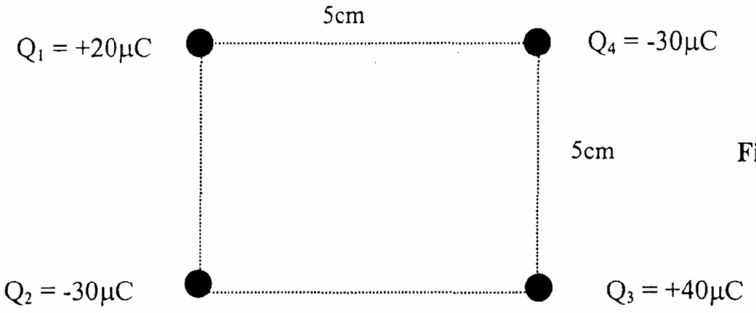

Figure 3.9

(Ans : a. +2160N $\boldsymbol{j}$, b. +4320N $\boldsymbol{i}$, c $-1145.5\,\boldsymbol{i} - 1145.5\,\boldsymbol{j}$, d. 3332.21 N, $\theta = 17.72^0$ (1^{st} quarter) @ 17.72 above posite x axis.)