

Name: \_\_\_\_\_ Section: \_\_\_\_\_ Score: \_\_\_\_\_/20

1. Very small and identical metal spheres A and B are with glass handles as in Fig. 1. Initially, A has no net charge and B has a net charge  $Q$ . After the metal spheres are connected, they are separated and placed as in the right-lower figure.

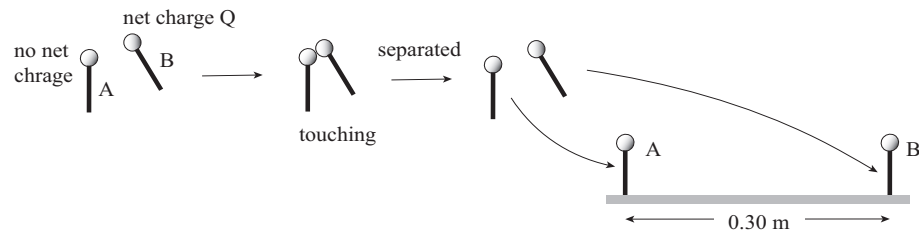


Figure 1:

(a) The magnitude of the force acting on charge at A is 10 N. What is the original net charge  $Q$  on B before touching with A? [5]

(b) If the above experiment is repeated with a doubled  $Q$ , what is the magnitude of the force acting on A? [5]

3. Look at the configuration of three charges in the figure 2. A and C have  $-2\ \mu\text{C}$  and B  $-3\ \mu\text{C}$ .

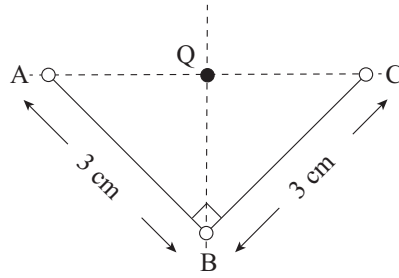


Figure 2:

(a) What is the total force acting on  $B$  from the other charges A and C? Compute its magnitude and indicate its direction in the figure 2. [5]

(b) Q is the point equidistant from all three points A-C and on the line connecting A and C. What is the total force acting on a  $2\ \mu\text{C}$  charge placed at Q? Compute its magnitude and indicate its direction in the figure 2. [5]