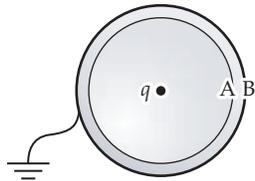




5. A charge of 0.80 nC is placed at the center of a cube that measures 4.0 m along each edge. What is the electric flux through one face of the cube?
- $90 \text{ N} \cdot \text{m}^2/\text{C}$
  - $15 \text{ N} \cdot \text{m}^2/\text{C}$  <=
  - $45 \text{ N} \cdot \text{m}^2/\text{C}$
  - $23 \text{ N} \cdot \text{m}^2/\text{C}$
  - $64 \text{ N} \cdot \text{m}^2/\text{C}$

6. A positive point charge  $q$  is placed at the center of an uncharged metal sphere insulated from the ground. The outside of the sphere is then grounded as shown. Then the ground wire is removed. A is the inner surface and B is the outer surface. Which statement is correct?



- The charge on A is  $-q$ ; that on B is  $+q$ .
  - The charge on B is  $-q$ ; that on A is  $+q$ .
  - The charge is  $\frac{q}{2}$  on A and on B.
  - There is no charge on either A or B.
  - The charge on A is  $-q$ ; there is no charge on B. <=
7. A particle (charge =  $50 \mu\text{C}$ ) moves in a region where the only force on it is an electric force. As the particle moves 25 cm from point A to point B, its kinetic energy increases by 1.5 mJ. Determine the electric potential difference,  $V_B - V_A$ .
- 50 V
  - 40 V
  - 30 V <=
  - 60 V
  - +15 V
8. Three identical point charges ( $+2.0 \text{ nC}$ ) are placed at the corners of an equilateral triangle with sides of 2.0-m length. If the electric potential is taken to be zero at infinity, what is the potential at the midpoint of any one of the sides of the triangle?
- 16 V
  - 10 V
  - 70 V
  - 46 V <=
  - 44 V

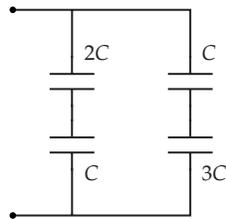
9. A charge is placed on a spherical conductor of radius  $r_1$ . This sphere is then connected to a distant sphere of radius  $r_2$  (not equal to  $r_1$ ) by a conducting wire. After the charges on the spheres are in equilibrium,

- a. the electric fields at the surfaces of the two spheres are equal.
- b. the amount of charge on each sphere is  $q/2$ .
- c. both spheres are at the same potential. <=
- d. the potentials are in the ratio  $\frac{V_2}{V_1} = \frac{q_2}{q_1}$ .
- e. the potentials are in the ratio  $\frac{V_2}{V_1} = \frac{r_2}{r_1}$ .

10. Two particles, each having a mass of 3.0 mg and having equal but opposite charges of magnitude 5.0 nC, are released simultaneously from rest when the two are 5.0 cm apart. What is the speed of either particle at the instant when the two are separated by 2.0 cm?

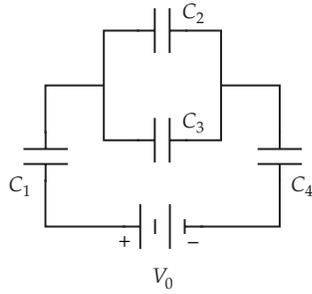
- a. 2.1 m/s
- b. 1.5 m/s <=
- c. 1.8 m/s
- d. 2.4 m/s
- e. 3.2 m/s

11. Determine the equivalent capacitance of the combination shown when  $C = 12$  nF.



- a. 34 nF
- b. 17 nF <=
- c. 51 nF
- d. 68 nF
- e. 21 nF

12. Determine the energy stored by  $C_4$  when  $C_1 = 20 \mu\text{F}$ ,  $C_2 = 10 \mu\text{F}$ ,  $C_3 = 14 \mu\text{F}$ ,  $C_4 = 30 \mu\text{F}$ , and  $V_0 = 45 \text{ V}$ .



- a. 3.8 mJ
- b. 2.7 mJ
- c. 3.2 mJ
- d. 2.2 mJ
- e. 8.1 mJ

<=