



1B quiz 1 version C

- Two point charges each have a value of $+30.0 \text{ mC}$ and are separated by a distance of 4.00 cm . What is the magnitude of the electric field midway between the two charges? ($k_e = 8.99 \times 10^9 \text{ Nm}^2/\text{C}^2$)
 - a. zero
 - b. $5.1 \times 10^7 \text{ N/c}$
 - c. $10.2 \times 10^7 \text{ N/c}$
 - d. $20.4 \times 10^7 \text{ N/c}$
- We have a hollow metallic sphere with charge -5.0 mC and radius 5.0 cm . We insert a $+10 \text{ mC}$ charge at the center of the sphere through a hole in the surface. What charge now rests on the outer surface of the sphere?
 - a. $+5 \text{ mC}$
 - b. $+10 \text{ mC}$
 - c. $+15 \text{ mC}$
 - d. -5 mC
- How strong is the electric field between the plates of a $.8 \text{ mF}$ capacitor, if the plates are 4.0 mm apart, the gap is filled with air, and plate each has a charge of $720 \mu\text{C}$?
 - a. 90 N/C
 - b. 225 N/C

- c. 450 N/C
 - d. 3.2×10^4 N/C
4. An electron starts from rest from a position 75 cm away from a fixed point charge of magnitude $q = -0.15\mu C$. How fast will it be moving when it is very far away? The mass of the electron is 9.1×10^{-31} kg and its charge is $-1.6 \times 10^{-19}C$
- a. 2.5×10^7 m/s
 - b. 1.4×10^7 m/s
 - c. 7.6×10^6 m/s
 - d. 3.1×10^6 m/s
5. Find the equivalent capacitance (i.e. the ratio of total charge to battery voltage) for the circuit shown in the Figure.
- a. 1.25 F
 - b. 1.71 F
 - c. 4.7 F
 - d. 6.7 F
6. A $3\mu C$ charge is located at the position $(x, y) = (0., 3.0m)$. What is the electric field at observation position $(x, y) = (4.0m, 9.0m)$?
- a. $519V/m \left(.554\hat{i} - .832\hat{j} \right)$
 - b. $4110V/m \left(.554\hat{i} - .832\hat{j} \right)$
 - c. $4110V/m \left(.554\hat{i} + .832\hat{j} \right)$
 - d. $519V/m \left(.554\hat{i} + .832\hat{j} \right)$
7. A spherical volume of space of radius 0.600 m has an electric field of intensity 100 N/C directed radially inward everywhere on its surface. What is the net charge enclosed within this surface?
- a. 6.8 nC
 - b. 4.0 C

- c. -6.8 nC
- d. -4 nC

8. Four charges are at the corners of a square, with B and C on opposite corners. Charges A and D, on the other two corners, have equal charge, while both B and C have a charge of $+2.0 \text{ C}$. What is the charge on A so that the force on B is zero?

- a. -1.0 C
- b. $-.71 \text{ C}$
- c. $-.5 \text{ C}$
- d. $-.35 \text{ C}$