1. Question Details SerCP8 16.P.006.soln. [882167]

To recharge a 15 V battery, a battery charger must move 3.5×10^5 C of charge from the negative terminal to the positive terminal. How much work is done by the charger? Express your answer in joules.

[ ] J

2. Question Details SerCP8 16.P.008. [1515252]

(a) Find the potential difference ΔV_e required to stop an electron (called a "stopping potential") moving with an initial speed of 2.81×10^7 m/s.

[ ] kV

(b) Would a proton traveling at the same speed require a greater or lesser magnitude potential difference? Explain.

(c) Find a symbolic expression for the ratio of the proton stopping potential and the electron stopping potential, $\Delta V_p/\Delta V_e$. The answer should be in terms of the proton mass m_p and electron mass m_e.

$\frac{\Delta V_p}{\Delta V_e} =$

3. Question Details SerCP8 16.P.012. [916777]

Two point charges are on the y-axis. A 3.5 μC charge is located at y = 1.20 cm, and a -2.34 μC charge is located at y = -1.00 cm.

(a) Find the total electric potential at the origin.

[ ] V

(b) Find the total electric potential at the point having coordinates (1.50 cm, 0).

[ ] V

4. Question Details SerCP8 16.P.026. [916752]

(a) When a 15.00 V battery is connected to the plates of a capacitor, it stores a charge of 30.0 μC. What is the value of the capacitance?

[ ] μF

(b) If the same capacitor is connected to a 21.00 V battery, what charge is stored?

[ ] μC

5. Question Details SerCP8 16.P.030.soln. [882191]

A 1 megabit computer memory chip contains many 6.4×10^{-14} F capacitors. Each capacitor has a plate area of 1.9×10^{-11} m^2. Determine the plate separation of such a capacitor. (Assume a parallel-plate configuration). The diameter of an atom is on the order of 10^{-10} m = 1 Å. Express the plate separation in angstroms.

[ ] Å

6. Question Details SerCP8 16.P.034. [916821]

Find the equivalent capacitance of a 4.90 μF capacitor and an 8.00 μF capacitor when they are connected as follows.

(a) in series

[ ] μF

(b) in parallel

[ ] μF

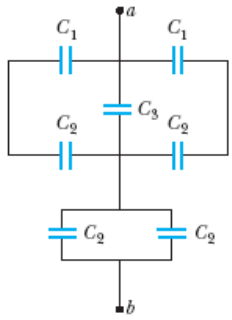
7. Question Details SerCP8 16.P.042. [895513]

Find the equivalent capacitance between points *a* and *b* for the group of capacitors connected as shown in the figure if C_1 = 6.00 μF, C_2 = 15.0 μF, and C_3 = 1.00 μF.

[ ] μF

If the potential between points *a* and *b* is 60.0 V, what charge is stored on C_3?

[ ] μC



8. Question Details SerCP8 16.P.046. [916763]

Two capacitors, C_1 = 19.0 μF and C_2 = 37.0 μF, are connected in series, and a 3.0 V battery is connected across them.

(a) Find the equivalent capacitance, and the energy contained in this equivalent capacitor.

equivalent capacitance ____ μF
total energy stored ____ J

(b) Find the energy stored in each individual capacitor.

energy stored in C_1 ____ J
energy stored in C_2 ____ J

Show that the sum of these two energies is the same as the energy found in part (a). Will this equality always be true, or does it depend on the number of capacitors and their capacitances?

(c) If the same capacitors were connected in parallel, what potential difference would be required across them so that the combination stores the same energy as in part (a)?

____ V

Which capacitor stores more energy in this situation?

---Select---

9. Question Details SerCP8 16.P.064. [882172]

When a certain air-filled parallel-plate capacitor is connected across a battery, it acquires a charge of 100 μC on each plate. While the battery connection is maintained, a dielectric slab is inserted into, and fills, the region between the plates. This results in the accumulation of an additional charge of 250 μC on each plate. What is the dielectric constant of the dielectric slab?

____

Assignment Details

Name (AID): **HW#2 - Due Friday, Jan. 30, 2015**
Submissions Allowed: **5**
Category: **Homework**
Code:
Locked: **No**
Author: **Segre, Phil (** psegre@physics.emory.edu **)**
Last Saved:
Permission: **Protected**
Randomization: **Person**
Which graded: **Last**

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