Manus Carnuts

Answes

AP E&M Unit 3 - Worksheet 1 - Capacitors

1. The inner and outer cylindrical conductors have radius 0.14 mm and 2.3 mm respectively. What is the capacitance of a 4 cm long piece of this wire? If 3 Volts is applied across the capacitor, how much energy could be stored?

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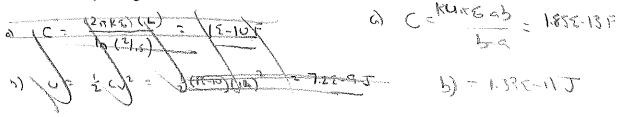
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2. What is the capacitance of the moon viewed as an isolated conductor? The moon's radius is approximately 1738 km.



- A spherical capacitor has been created so the inner sphere has a radius of 0.5 mm and the outer sphere has a radius of 2mm.
- a. If the insulator that is separating them has a dielectric constant of 2.5, what is the capacitance of the sphere?
- b. With a 12 V potential difference, how much stored energy is in this capacitor when it is fully charged?



4. The plates of a spherical capacitor have radii of 25mm and 28 mm respectively. What must the area of a parallel plate capacitor be to have the same capacitance and separation as the spherical capacitor?

5. In an attempt to design a cylindrical capacitor of 4E-6 F, you have two wires, one of radius 6cm, the other of radius 2.6 cm. If you are to separate these two conductors with a dielectric (dielectric constant of 4.5), how long would you need to make the wire?