Chapter 25 exercises

Q1. A capacitor with capacitance of 1.25 pF is charged by applying a voltage of 12 V across its ends. The total charge of the capacitor is:

Q2. A parallel-plate capacitor with plate's area 25 cm^2 and separation of 17.7 mm is charged by applying a voltage of 12 V across its ends. The capacitance of the capacitor is:

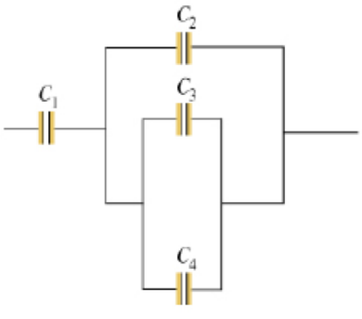
Q3. A parallel-plate capacitor has a capacitance of 8 μF. Its capacitance if the plate separation is doubled is:

Q4. Referring to Example 3, if the plate area of the capacitor is doubled. The capacitance will be:

Q5. A coaxial cable of radii 5 mm and 3 mm is connected by a battery of 12 V. If the charge on each cable is 6 nC, the length of the capacitor is:

Q6. Two concentric spherical shells of radii 4 cm and 3 cm has a charge of 5 nC. The potential difference across the capacitor is:

Q7. As shown in the figure, C_1= 6μF and C_2= C_3= C_4= 2μF. The equivalent capacitance is:

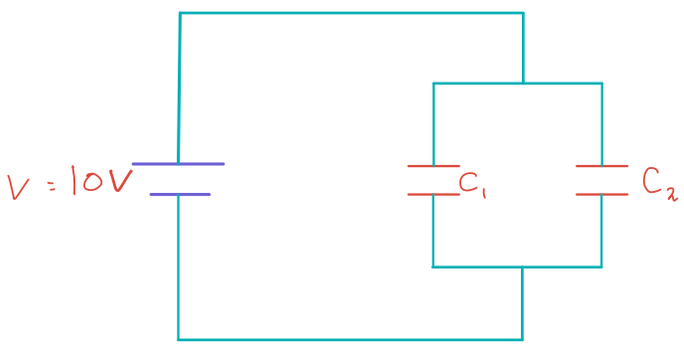


Q8. An isolated conducting sphere whose radius R is 6.85 cm has a charge q = 1.25 nC. The potential energy stored in the electric field of this charged conductor is:

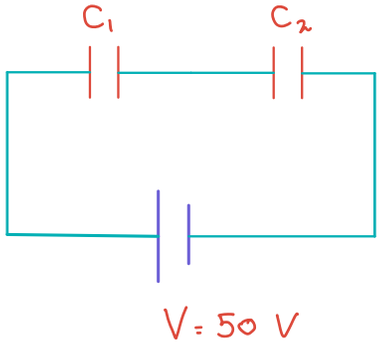
Q9. Referring to Example 8, the energy density at the surface of the sphere is:

Q10. A parallel-plate capacitor whose capacitance C is 13.5 pF is charged by a battery to a potential difference $V = 12.5$ V between its plates. The potential energy of the capacitor–slab device after a porcelain slab ($\kappa = 6.50$) is slipped between the plates is:

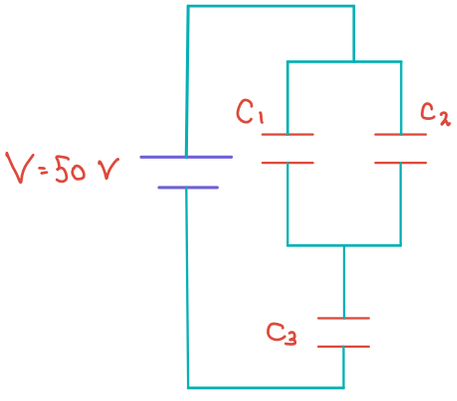
Q11. According to the figure, C1 = 3 F, C2 = 5 F and V = 10
a) find the equivalent capacitance.
b) find the charge on C2
c) find the electric potential on C1



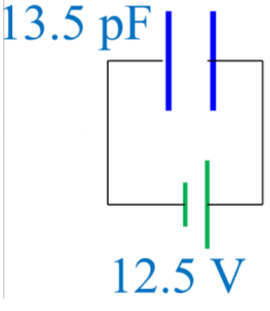
Q12. According to the figure C1 = 4 F, C2 =5 F, and V = 50 V
a) Find the equivalent capacitance
b) find the charge on C1
c) find the potential energy



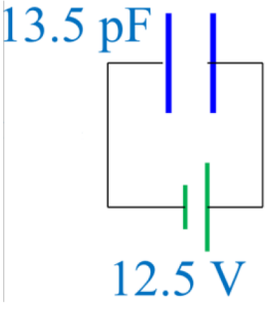
Q13. According to the figure C1 = 4 F, C2 = C3 = 5 F, and V = 50 V
a) Find the equivalent capacitance
b) find the charge on C1
c) find the potential energy on C3



Q14. According to the figure, find the potential energy in the capacitor



Q15. According to the figure, find the potential energy in the capacitor if a dielectric slab 3.5 is introduced between the plate



Q16. If the voltage V has doubled, the potential energy U will be:

a) U b) $2U$ c) $4U$ d) Zero

Q17. A parallel plate capacitor has Area of 10 cm^2 seperated by 5 mm find the total charge on the plate when 12 V battery is connected

Q18. A parallel plate capacitor of plate area 15 cm^2 and seperation 3 mm has a total charge of 20 nC the potential difference between the plates is

Q19. A parallel plate capacitor of plate area 15 cm^2 and seperation 3 mm has a total charge of 20 nC the stored energy is:

Q20. A capacitor with capacitance C stores a charge of q when a voltage is V. If the voltage is doubled, the capacitance will be

a) $C/2$ b) C c) $2C$ d) Zero

Q21. A cylindrical capacitor with capacitance C and length L, if L is halved the Capacitance will be:

a) $C/2$ b) C c) $2C$ d) Zero