Physics 200

Chapter 28   DC Circuits (Homework)

1. Resistor, R_1, is in series with resistors, R_2 and R_3, which are in parallel. Calculate the equivalent resistance of the circuit.

2. Calculate the current through resistor, R, of the circuit in Figure P28.27 (9th edition).

3. Calculate the power of resistor, 2R, of the circuit in Figure P28.27 (9th edition).

4. A capacitor, C, is connected in series to a resistor, R, and a battery, V. At what rate is energy being dissipated by the resistor "t" seconds after the battery is connected to the resistor and capacitor?

5. In Figure P28.65 (9th edition) assume the switch has closed at time, $t = 0$. If the capacitors are initially uncharged, what is the charge on capacitor, C_1, as a function of time after the switch is closed?

6. In Figure P28.41 (9th edition) assume the switch has open for a very long time. The switch is then closed. Calculate the current through resistor, R_2, as a function of time.

7. In Figure P28.41 (9th edition) assume the switch has closed for a very long time. The switch is then opened. Calculate the current through resistor, R_1, as a function of time.

8. Show that, when a charged capacitor is discharged through a resistor, the total energy initially stored in the capacitor is equal to the total energy dissipated by the resistor. (Hint: integrate the power over all time for the resistor and remember that current varies with time.)