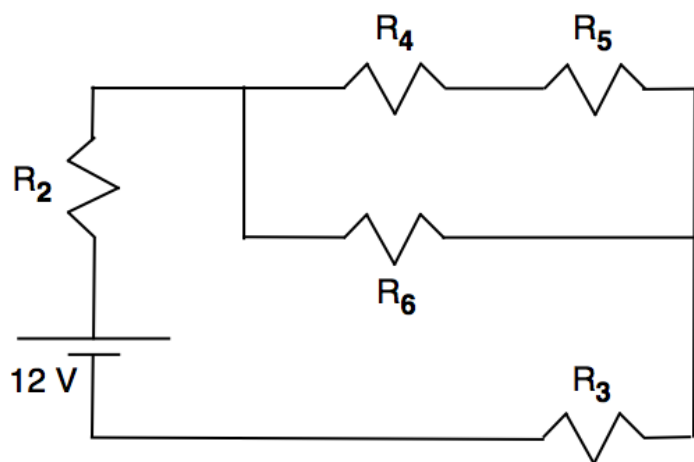


Physics 10164 – Spring 2019 Exam 2C

Partial credit will be given provided you show all work and are solving parts of the problem correctly. Points will be deducted if you don't show your work even if you get the right answer. Clearly indicate your answer with a circle or a box and remember to include correct units and significant figures.

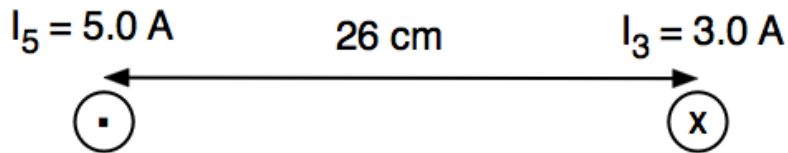
(30 pts) For the circuit below, $R_2 = 2.0\ \Omega$, $R_3 = 3.0\ \Omega$, $R_4 = 4.0\ \Omega$, $R_5 = 5.0\ \Omega$, $R_6 = 6.0\ \Omega$.

- (a) Find the power dissipated by the resistor R_6 .
(b) If the branch containing R_4 and R_5 were removed from the circuit, what happens to your answer to (a)? Explain.



2. (40 pts) Two straight wires are oriented perpendicular to the page as shown. Wire 5 passes through the origin and wire 3 passes through $x = 26$ cm.

- a) For what value of x (besides infinity) is the total magnetic field due to the two wires equal to zero?
- b) An electron is moving toward the left side of the page through the point midway between the two wires. What is the magnitude and direction of the magnetic force on the electron if the velocity is 3.6×10^5 m/s?



3. (30 pts) Below, we are looking end-on at a 330 turns/cm solenoid of radius 28 cm with a clockwise current of 3.5 Amps. Inside the solenoid is a single-turn wire loop with a radius of 12 cm oriented so that its area vector is parallel with the axis of the solenoid. The current in the solenoid is increased to 15 Amps during a time interval of 0.50 seconds.

- a) What is the magnitude of the induced EMF in the single-turn wire loop during this time interval?
- b) What is the direction of the induced current in the single-turn wire loop during this time interval?
- c) What is the magnitude of the torque on the single-turn wire loop during this time interval?

