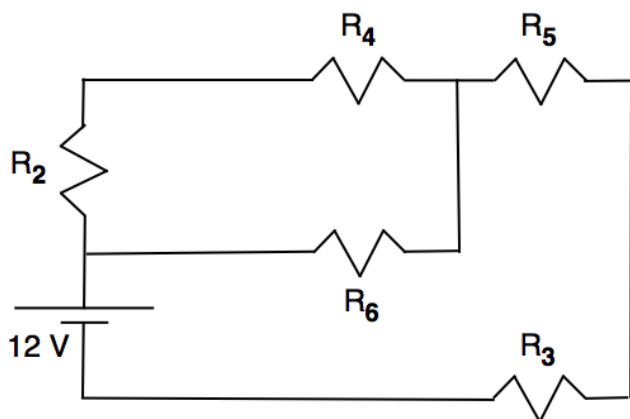


Physics 10164 – Spring 2019 Exam 2E

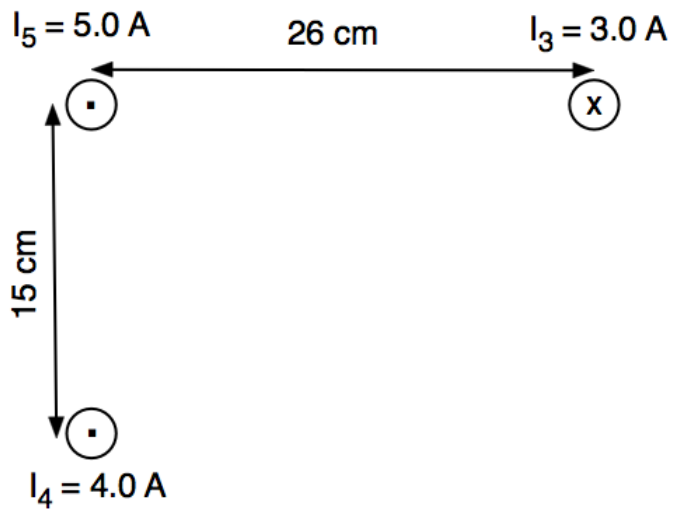
Partial credit will be given provided you show all work and are solving parts of the problem correctly. Points will be deducted if you don't show your work even if you get the right answer. Clearly indicate your answer with a circle or a box and remember to include correct units and significant figures.

(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 R_4 were removed from the circuit, what happens to your answer to (a)? Explain.



2. (40 pts) Three straight wires are oriented perpendicular to the page as shown. Find the magnitude and direction of the magnetic force per unit length felt by wire 4 as a result of the magnetic field generated by wires 5 and 3.



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?

