

## Assignment 10 DC Currents

- $10^{10}$  electrons/sec travel down a wire having a circular cross section. What is the current in the wire expressed in amps?
- A kettle draws 3 A of DC current when it is connected to a 10 V battery.
  - What is the kettle resistance?
  - What power is supplied to the kettle?
  - If the kettle has 1 liter of water initially at a temperature of 20 C, how long will it take for the water to be heated to 90C?
- A laboratory only has 2 ohm resistors.
  - Draw the circuit required to create a 3 ohm resistance
  - Show that the total power dissipated in the above circuit is the same as when a single 3 ohm resistor is available.
- Consider the Wheatstone bridge circuit shown below. Show that no current passes through  $R_5$  if  $R_1 / R_3 = R_2 / R_4$

