**Assignment 6 – Ohm’s Law Name: ………………………………….**

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| --- | --- |
| $$V=IR$$ | $$I=\frac{Q}{t}$$ |
| $$e=1.6×10^{-19} C$$ | $$R=\frac{ρl}{A}$$ |
| $$P=IV$$ | $$E=IVt$$ |

1. In your own words describe the concepts of voltage, current, charge and resistance. (4)

|  |  |
| --- | --- |
| Voltage |  |
| Current |  |
| Resistance |  |
| Charge |  |

1. A wire carries a current of 1.6 A. How many electrons pass a given point in the wire per second? (1)
2. The brightness of a lightbulb is a poor way to measure a current. What piece of equipment is a better way? Show how you would include it in a circuit with the bulb. (2)
3. A person notices a mild shock is the current along a path between the thumb and index finger exceed 80 µA (80 x 10-6 A). Calculate the voltage required to experience a shock if:
4. The fingers are wet (*R* = 2000 Ω) (1)
5. The fingers are dry (*R* = 4.0 x 105 Ω) (1)
6. My kettle carries a current of 10.0 A and is connected to the mains at 120 V. What is its resistance? (1)
7. I have a circuit with two bulbs in parallel and a single switch to control them. Draw a circuit diagram. (2)
8. Add to the diagram to show how to measure the voltage across one of the bulbs. (1)
9. The convention is that the current is said to flow from positive to negative. Yet the actual electrons drift around the circuit the other way! Explain this apparent contradiction. (2)
10. Find out about a basic battery. Draw a labelled diagram to show how it works. (2)
11. Find out about an incandescent bulb. Draw a labelled diagram to show how it works. (2)
12. A voltage of 12 V produces a current of 0.40 A in a 3.2 m length of wire with a radius of 0.40 cm. What is the resistance of the wire and its resistivity? (3)
13. A 50.0 m long wire of diameter 2.0 mm is connected to a battery with a voltage of 9.11 V and a current of 36.0 A is produced. Using the data table from powerpoint 3.3, identify the metal that the wire is made from. (3)