Name: Class:

Total Possible Marks: 16

Resistance and IV Characteristics

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10

1.

(a) Resistance is anything in the (b) circuit which (c) reduces the (d) flow of (e) current. It is measured in ohms. The current flowing through a (f) component depends upon the (g) potential difference across it and the resistance of the component itself.

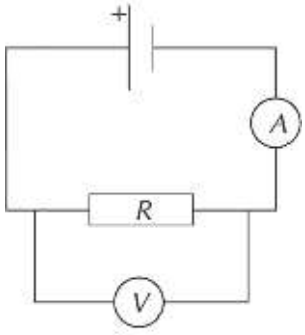
The (h) greater the resistance of a component, then the (i) smaller the current flowing through it for a given potential (j) difference, factors all linked together in the expression:

$$V = IR$$

circuit	component	potential	Resistance	greater
difference	smaller	current	flow	reduces

___ 6

2. The relationship between potential difference current and resistance is given by the expression:



$$V = I \times R$$

Where V is the potential difference measured in volts, I is the current measured in amperes and R is a resistance measured in ohms.

* Allocate one mark for the calculation, that is the correct transposition of the equation and a 2nd mark for the correct answer

___ 2 a. A voltmeter in a circuit across a resistor of resistance 4 ohms displays a reading of 6 V. An ammeter connected to the circuit would display what reading in amperes?

Given the expression above we know that V = IR so by rearrangement I = V / R. Substituting known values of V and R:

I = 6 / 4 = 1.5 amperes

___ 2 b. The resistor is exchanged for another one, this time the ammeter reached 3 A, if the potential difference remains the same what is the resistance of the new component?

Using V = IR and rearranging for R = V / I we simply plug in the known values of 6 V and 3 A to reach a value of 2 ohms.

___ 2 c. If we increase the potential difference by 100% and take a reading from the ammeter of 0.000025 A (25 micro amps) what is the resistance of the resistor component now?

Increasing the potential difference by 100% simply means doubling it to 12 V, using the expression R = V / I and substituting our known values we arrive at a resistance of:

R = 12 / 0.000025 = 480,000 ohms which could also be written as 480 kΩ or 0.48 MΩ