Test:
Electrical Circuits

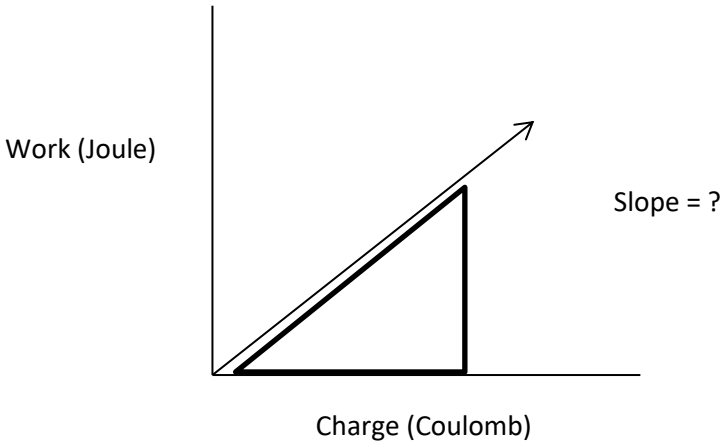
INFORMATION SHEET:

- $I = \frac{Q}{\Delta t}$
- $R = \frac{V}{I}$
- $V = \frac{W}{Q}$
- $\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2}$ ....
- $R_s = R_1 + R_2$ ....
- $R_{total} = \frac{V_{EMK}}{I_{HFST}}$

THERE ARE FOUR POSSIBLE ANSWERS, CHOOSE ONLY A,B,C OR D.

QUESTION 1:

1.1) What does the slope of the following graph represent?

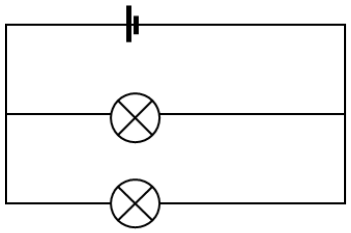


A.) Volts.
B.) Charge.
C.) Ampere.
D.) Ohm. (2)

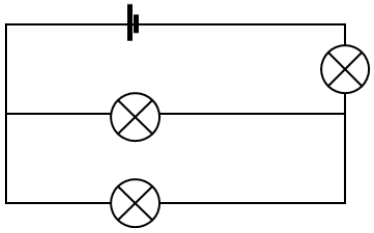
1.2) Which term is a correct description for the following definition: The maximum energy provided to the circuit per coulomb charge.

A.) Labour.
B.) EMK.
C.) Volts.
D.) Current strength. (2)

1.3) Which circuit's main current will have a value of I = $\frac{2}{R}$ A is the EMK is 3V and each resistor is R ohm?



Circuit 1



Circuit 2

A.) Circuit 1.
B.) Circuit 2.
C.) Both.
D.) None of the above. (2)

1.4) An Ohmic conductor will abide to which law?

A.) Coulomb's law.
B.) Newton's 2nd law.
C.) Ohm's law.
D.) None of the above. (2)

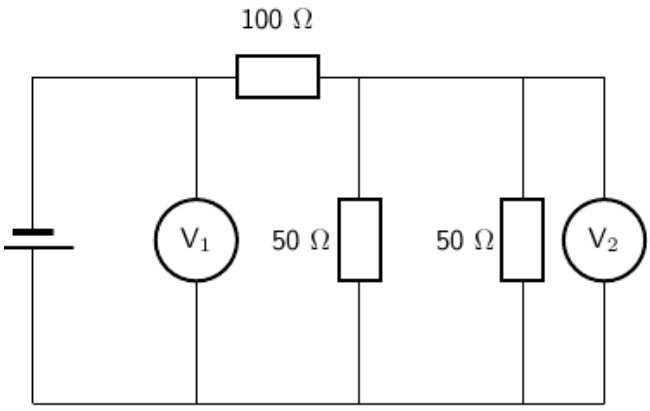
1.5) If charge is made the subject between two equations, what will the value of the amount of labour done be?

Equation 1: V = $\frac{W}{Q}$.
Equation 2: I = $\frac{Q}{\Delta t}$.

A.) W= Jas
B.) W=A.s.v^{-1}.
C.) W=Q.s.A
D.) None of the above. (2)

QUESTION 2:

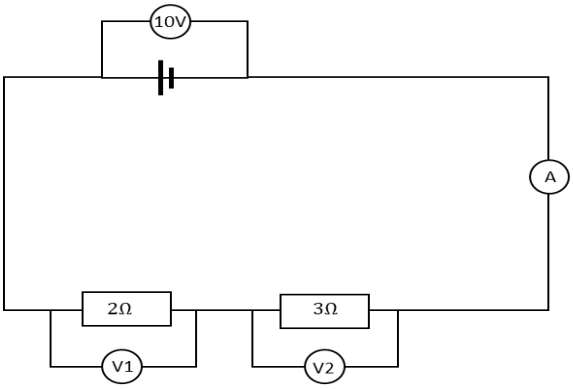
2.1) Define the term electrical current strength. (2)
2.2) Consider the following circuit:



2.2.1) Calculate the total resistance of the circuit. Ignore internal resistance. (4)
2.2.2) If the value of the EMK is x and the voltmeter over the 100 ohm meter has a value of 100I, determine a calculation for the EMK in terms of x.
(5)

QUESTION 3:

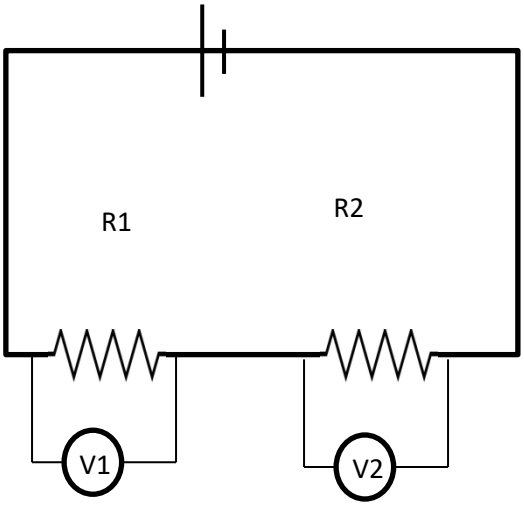
Study the following circuit. Internal resistance can be ignored.



3.1) Calculate the reading on the Ammeter. (3)
3.2) Do calculations to determine that the reading on the battery is in fact correct. (4)
3.3) If there are two new resistances connected in parallel, will the reading of the main current decrease, increase or remain the same? Motivated your answer. (3)

QUESTION 4:

The following circuit has an EMK of 3V.

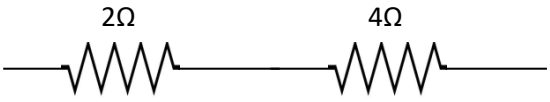


4.1) Calculate the values of both voltmeters if the resistors are identical. (1)
4.2) Calculate the amount of charge that passes the resistors in 2 seconds if the resistors each have a value of 3 ohm. (5)
4.3) How much work is done over the resistors in total? (3)

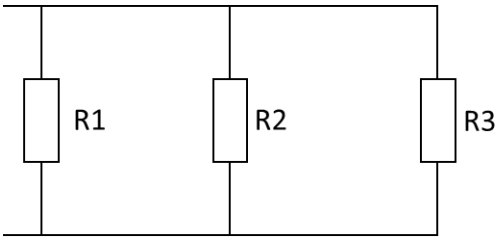
QUESTION 5:

5.1) Study the following resistors. Which resistor connection has the highest value? Do calculations to prove your answer.

(4)



(Connection 1)



R1 = 3Ω R2 = 4Ω R3= 3R2 (Connection 2)

QUESTION 6:

6.1) Study the following graph. How will the line look that represents a larger resistance? Why you're your choice look like that? Draw your line with colour on the graph. (3)

6.2) Calculate the area of line 1 and the area of your line using the graph. (3)
6.3) Which factors will influence the resistance of a conductor? (3)

