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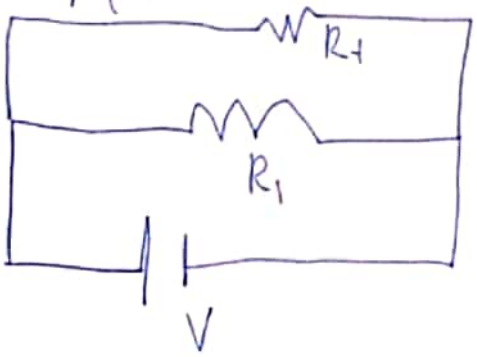
Q No 1.

Given:- We have given two well known formula for calculating Resistance.

Required:- Write two formula for any Number of parrated Resistance:

Sol:- As we know;-



$V = IR$.

From figure:

$$V_1 = V_2 = V_3$$

$$I = I_1 + I_2 + I_3$$

$$\frac{V}{R} = \frac{V}{R_1} + \frac{V}{R_2} + \frac{V}{R_3}.$$

P. T. O.

$$\frac{V}{R} = V\left[\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}\right]$$

$$\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}.$$

So,

(a) For two Resistors:-

$$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2}.$$

$$\frac{1}{R} = \frac{R_2 + R_1}{R_1 R_2} \rightarrow (1)$$

We can also write (1) as,

$$R_T = \frac{R_1 R_2}{R_1 + R_2} \Rightarrow \text{Required formula.}$$

For n number of Resistors.

$$\frac{1}{R_n} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \frac{1}{R_4} + \frac{1}{R_5} \cdots$$

Q- 1

part (b)

Given:- $G = \frac{1}{R}$

In Series, Resistance >> and Conductance << with the addition of more resistors.

Required:- What heppens to total - Resistance and Conductance in Parallel.

Sol:- As we know

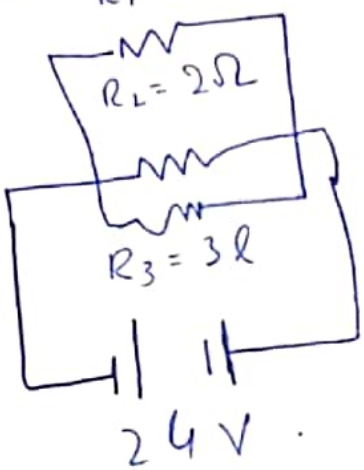
$G = 1/R$,

So, for parallel combination the total Resistance is "Decreased" will the conductance will "increases" due to.

$$\boxed{G = 1/R}$$

Question # 2

Given data:



Required data: Calculate amount of Current drawn by each resistor!

Solution: Since, R_1 is in parallel :- so,

$$= \frac{1}{R_1}$$

$\therefore V_T = V_1 = V_2 = V_3$.

Thus $I_1 = \frac{V_1}{R_1}$

$$I_1 = \frac{24}{1} = 24 \text{ amp.}$$

⇒ As, R_2 is in series.

Thus $I_2 = \frac{V_2}{R_2}$.

$I_2 = \frac{24}{2} = 12$ amp.

⇒ As R_3 is in parallel series:

$I_3 = \frac{V_3}{R_3} = \frac{24}{3} = 8$ amp.

Now power dissipated by each Resistor :=

$P = VI$.

$P_1 = V_1 I_1 = 24 \times 24 \Rightarrow$

$= 576$ W.

$P_2 = V_T I_2$.

$= 24 \times 12 \Rightarrow 288$ W.

$P_3 = V_T I_3$.

$= 24 \times 8 = 192$ W

Question ⇒ 3

Part (a) :⇒.

Current :=

Current is a flow of electrical charge Carries, usually electron or electron-deficient atoms.

Dented by: Bassically, Currented is denoted by "I"

Unit: Its unit is Amphere or Amperage.

Relationship: current is the effect. it can not flow without voltage

Measuring instruement: Current is measured by an instruement known as "Ammeter"

SI Unit:

Its unit is Amphere.

and 1 Amphere = $\frac{1 \text{ Coloumb}}{\text{sec}}$.

In Series Connection :-

Current is same through all components Connected in Series.

In a parallel Connection: Current gets distributed over components Connected in parallel.

Voltage:-

It is also called electromotive-force. It can be defined as:

"potential difference in charge between two points in an electrical field."

OR

"Energy per unit charge".

Unit:- Volts

Measuring: Measured by Voltmeter.

SI unit:- 1 Volt = 1 Joule/Coloumb.

In Series Connection Voltage gets distributed over Components Connected in series.

In a parallel :- Voltage are the same across all components Connected in parallel.

(b) :=

Resistance :- "It is the measure of opposition to current flow in an electrical circuit."

Measured:- Measured in ohm.

Symbolically:- Greek letter omega (Ω).

Unit:= Its unit is ohm meter.

Conductance :⇒

"potential for a substance to conduct electricity".

It is the measure of how easily electrical current can pass through a material.

Inverse :- Inverse of Resistance.

Represented :- by $1/R$.

Unit: standard unit is the Siemens (S):

(c)

Energy:= Defined as "Capacity to do some work" - It is the power which is integrated over time.

Unit:- Joules or Watt/second.

Symbol: "W" is the symbol which denoted Energy.

changes. Energy changes from one form to another.

Stored:- Energy is known to be stored which can be used in future.

Power.

1. The Rate at which a specific work is done."

Unit:- Watt or Joules/second.

Symbol:- "P"

Cannot Transformed:= power can not be Transformed from one form to another

part (d) :-

Inductance :- "It is a property of a current carrying conductor which generates a magnetic field around the conductor.

unit: Henry (H)

In SI base units: $kg \cdot m^2 \cdot s^{-2} \cdot A^{-2}$.

Capacitance :- "It is a property of a device to hold and store electric charges."

SI unit :- Its unit is farad (F):

In SI base units: $F = A^2 s^4 kg^{-1} m^{-2}$.

part (e)

Synchronous motor :- "It is an AC motor in which at steady state the rotation of shaft is synchorized with the frequency of the supply current".

Electrical frequency :- The electrical frequency used typically 60 HZ or 50 HZ.

Used for :- used in timing-applications such as in synchronous clocks, tape-recorders etc.

Asynchronous Motor :=

It is a machine whose rotor rotates at the speed less than synchronous motor.

Used in : In particularly, an asynchronous motor with 3-phase is used in industry due to the reason like it a low cost. maintaince is easy and simple.

The End.