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Question: 2

Page 1

Answer:

Given:  $V = 24$  volt

$$R_1 = 1 \Omega$$

$$R_2 = 2 \Omega$$

$$R_3 = 3 \Omega$$

Required

Current,  $I = ?$

Power,  $P = ?$

Solution: -

$$V = IR$$

$$I = \frac{V}{R}$$

$$I = \frac{24}{1}$$

$$\boxed{I = 24 \text{ A}}$$

$$I_2 = \frac{V}{R}$$

$$I_2 = \frac{24}{2}$$

$$\boxed{I_2 = 12 \text{ A}}$$

$$I_3 = \frac{V}{R}$$

$$I_3 = \frac{24}{3}$$

$$I_3 = 8A$$

Find power and for each resistor.

$$P_1 = IV$$

$$P_1 = (24)(24)$$

$$P_1 = 576w$$

$$0.56 Kw$$

$$P_2 = IV$$

$$P_2 = (12)(24)$$

$$P_2 = 288w$$

$$0.28 Kw$$

$$P_3 = I_3 V$$

$$P_3 = (8)(24)$$

$$P_3 = 192w$$

$$0.19 Kw$$

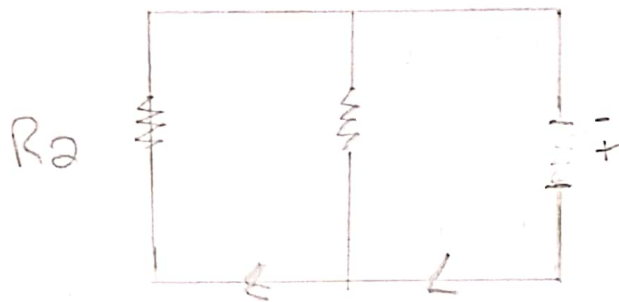
# Question 1

## Answer

### Solution

Solving on two formulas  
for total resistance.

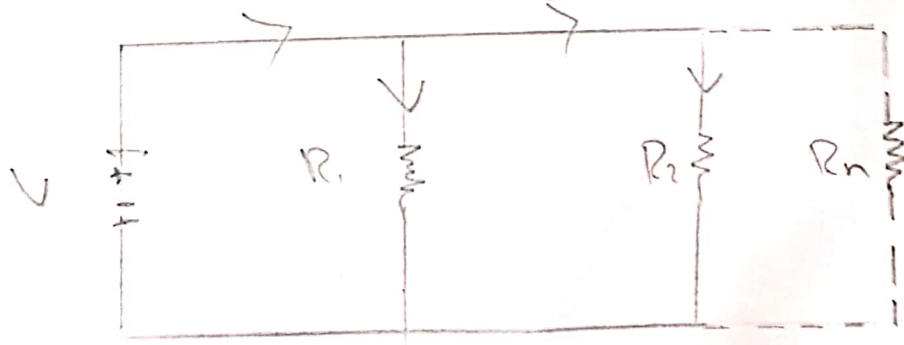
(a)



$$\frac{1}{R_{\text{total}}} = \frac{1}{R} + \frac{1}{R_2}$$

$$R_{\text{total}} = \frac{R_1 \cdot R_2}{R_1 + R_2}$$

(b)



For any number of resistance

$$\frac{1}{R_{\text{total}}} = \frac{1}{R} + \frac{1}{R_2} + \frac{1}{R_3} + \dots + \frac{1}{R_N}$$

R Total

Page 4

$$\frac{R_1 \cdot R_2 \cdot \dots \cdot R_n}{R_1 + R_2 + R_3 \cdot \dots + R_n}$$

Part b

R total

$$\frac{R_1 \cdot R_2 \cdot \dots \cdot R_n}{R_1 + R_2 + \dots + R_n}$$

In the addition of parallel resistor in parallel circuit resistance decreases and Conductance increases with the addition of more ~~resistance~~ resistors.

Q3AnswerCurrent

- Current is the rate at which charge is flowing in a circuit.

- It is the amount of charges that pass through any point of the circuit per unit time

$$\text{Current} = \text{Charge} / \text{time}$$

$$I = Q / t$$

unit Colomb/sec = (A)

- Current get distributed over components connected in parallel.

Voltage

- Voltage, also called electromotive force, is the potential difference in charge.

- It is measured by voltmeter.

- Voltages are the same across all components connected in parallel.

## Resistance

Resistance is the opposition that substance offers to the flow of electric current. The term contrasts the conductance.

- Amount of charge that flows through circuit depends two things.
- Voltage provided by sources
- Electric resistance of the conductor.

$$R = \frac{V}{I}$$

unit: Ohm's

## Conductance

is the measure of how easily electrically flows along a certain path through an electrical element.

- $1/P$  and has the unit of Siemens per metre,  $S/m$ .

## Power

The Capacity or ability to direct or influence the behaviour of other or the course of events.

- Move or travel with great speed or force.

-  $P = IV$

- unit of power is the WATT (W).

## Energy

In physics, Energy is the Quantitative amount that must be transferred to an object in order to perform work on, or to heat, the object.

- The SI unit of energy is Joule.

- The formula for the energy of motion is  $KE = \frac{1}{2}mv^2$

## Inductance

- Inductance is a property of current carrying conductors which generates a magnetic field around the conductor.
- Inductance is measured by Henry (H) and is symbolized as  $L$ .
- The electrical component associated with inductance is known as inductors, which usually coils with a core or without a core.

## Capacitance

- Capacitance is the ability of a device to store electric charges.
- Capacitance is measured in Farad (F) and symbolized as  $C$ .
- Capacitance is associated with capacitors. They are several types of capacitors used in circuit.



(e) Synchronous motor and AsynchronousSynchronous motor

- Its construction is complicated.
- It is not self starting.
- Separate DC source required.
- Speed control is not possible.
- Load increases, load angle increases.
- Motor sensitive.
- May hunt.
- It is costly.
- Require frequent maintenance.

Asynchronous motor

- Its construction is simple.
- It is self starting.
- Rotor gets excited by the induced e.m.f.  
So separate source is not necessary.
- Speed control is possible difficult.
- As load increases, the speed keeps on decreasing.
- Phenomenon of hunting is absent.
- Motor is cheap, especially cage rotors.
- maintenance free.