Q. 1.

Part A.

Ans:

For two resistance.

$$R_{eq} = \frac{R_1 + R_2}{R_2 + 1}$$

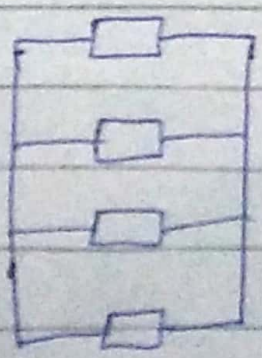
For (N) number of Resistance

$$R_{eq} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} \cdots + \frac{1}{R_n}$$

Q. 2.

Part B:

In a parallel circuit resistance decrease and Conductance increase with the addition of more resistors.

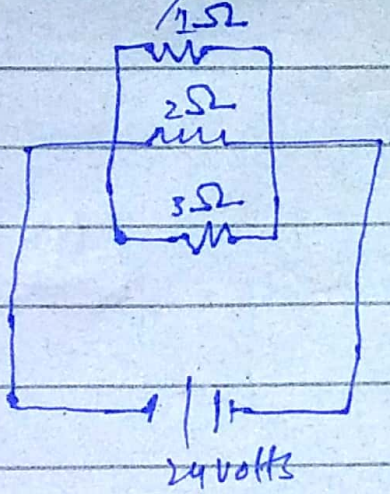


Adding Successive Resistors in Parallel.

R_{eq} increase with more resistors.

G_{eq} Decrease with more resistor.

Q.2. In the given circuit, Three resistors receive the same amount of voltage (24 volts) from single source. Calculate the amount of current "drawn" by each resistor, as well as the amount of power dissipated by each resistor.



Sol:

Given data:

voltage, V = 24 volts.

Resistance, $R_1 = 1\ \Omega$

$R_2 = 2\ \Omega$

$R_3 = 3\ \Omega$

Required:

Current, I_1, I_2, I_3

power, P_1, P_2, P_3.

Current:

By ohm's law.

$I = V/R$.

For I_1 : $V = 24$ volts, $R_1 = 1\ \Omega$

$$I_1 = \frac{V}{R_1} = \frac{24}{1}$$

$$\boxed{I_1 = 24\ A}$$

For I_2 : $V = 24$ volts, $R_2 = 2.5\ \Omega$

$$I_2 = \frac{V}{R_2} = \frac{24}{2}$$

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

For I_3 : $V = 24$ volts, $R_3 = 3\ \Omega$

$$I_3 = \frac{V}{R_3} = \frac{24}{3}$$

$$\boxed{I_3 = 8A}$$

Power = $P_1 = I_1 \cdot V$

~~FSL 24 volt = 2~~

$I = 24A$, $V = 24$ volts.

$P_1 = I \cdot V = 24 \cdot 24$

$$\boxed{P_1 = 576 \text{ watts}}$$

$P_2 = I_2 \cdot V$

$= 12 \cdot 24$

$$\boxed{P_2 = 288 \text{ watts}}$$

$P_3 = I_3 \cdot V$

$= 8 \cdot 24$

$$\boxed{P_3 = 192 \text{ watts.}}$$ Ans.

Q. 3 Differentiation b/w following:

1) Current & voltage :-

Current	voltage.
1) Current is the rate at which electric charge flows past a point in a circuit. Current is the rate of flow of electric charge.	1) voltage also called electro-motive force, is the potential difference in charg b/w two points in an electrical field. In other words, voltage is energy per unit charge.
2) Symbol is I	2) Symbol is V
3) unit is amperage (or) A. Current cannot flow with out voltage	3) unit is voltage (or) volts
4) 1A = 1 coulomb/second	4) Voltage can exist without current.
	5) 1V = 1 joule/coulomb

2) Energy

Energy is the capacity to do work. Energy is power integrated over time. unit is joules. Symbol is W

Power.

1) Power is the rate at which work is done, (or) energy is transmitted.
2) unit is joules/second.
3) Symbole is P.

b) Resistance & Conductance.

Resistor is a property of a Conductor which tells us how much the resistor (or) opposes the current to pass throw it Whereas conductance is a property of a Conductor which tells us how much the resistor allow the current to pass through it The SI unit for electrical Resistance is Ohm (Ω). The SI unit for electrical conductance is (S).

c) Inductance & Capacitance.

Inductance is a property of a current carying conductor which generates a magnetic field around the conductor whereas Capacitance is a property of a device to hold and store electric charge inductance is measured by Henry (H) and is symbollized as L. Capacitance is measured in farads (F) and is symbollized as C.

E) Synchronous motor

- Construction is Complicated.
- Not self starting
- Separate DC Source is required for rotor excitation
- The speed is always Synchronous irrespective of the load
- Speed control is not possible.

Asynchronous motor

- Construction is simpler, particular in case of Cage rotor.
- Self starting.
- Rotor gets excited by the induced emf So Separate Source is not necessary.
- The speed is always less than Synchronous but never Synchronous.
- Speed control is possible through difficult.