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Q No 1

Part (a)

Ans Two formula for finding total resistance in parallel

$$1) \frac{1}{R_{Tot}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \dots$$

This formula does not give you the total resistance  $R_{Tot}$ . It gives you the reciprocal of  $R_{Tot}$  or  $\frac{1}{R_{Tot}}$ .

$$2) R_{Tot} = \frac{R_1 \times R_2}{(R_1 + R_2)}$$

This formula is often referred to as "product over sum".

Q No 1

Part (b)

Ans In the addition of parallel resistor in parallel circuit resistance decrease and conductance increases with the addition of more resistance.

Q No 2

Ans

Given data

$$\text{Voltage} = V = 24V$$

$$\text{Resistor} = R_1 = 1\Omega$$

$$\text{Resistor} = R_2 = 2\Omega$$

$$\text{Resistor} = R_3 = 3\Omega$$

Required

$$I = ? , P = ?$$

Solution:

$$V = 24V$$

$$I_1 = \frac{V}{R}$$

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

1

$$I_1 = 24A$$

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

R<sub>2</sub>

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

2

$$I_2 = 12A$$

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

R<sub>3</sub>

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

3

$$I_3 = 8A$$

Power dissipated by each resistor:

$$P = VI$$

$$P_1 = V I_1$$

$$P_1 = 24 \times 24$$

$$P_1 = 576 \text{ W}$$

$$P_2 = V I_2$$

$$P_2 = 24 \times 12$$

$$P_2 = 288 \text{ W}$$

$$P_3 = V I_3$$

$$P_3 = 24 \times 8$$

$$P_3 = 192 \text{ W}$$

$$P_3 = 192 \text{ W}$$

# "DIFFERENCES"

## CURRENT

The rate of flow of charges through a cross section of a conductor.

Current need complete closed conducting path to flow.

End of the conducting path must

have a potential difference.

$$I = \frac{\Delta Q}{\Delta t}$$

## RESISTANCE

→ Electric potential difference b/w two points of a conductor.

→ Sometimes described as "electric pressure" that

make current flow.

→ supplies the energy of the circuit.

→ Measured in volts (V) using a voltmeter.

6

## CONDUCTANCE

## RESISTANCE

The conductance of a conductor is the reciprocal of its electrical resistance.

It is a measure of the blood flow through vessel for given pressure difference.

This is generally expressed in terms of ml/sec/mmHg.

Conductance =  $\frac{1}{\text{resistance}}$

→ Resistance is the restriction of electron flow.

→ Resistance is the opposition that an

electrical device has to the flow of electrical current

→ Resistance is the property of a conductor

to resist the flow of electron through it.

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

①

## ENERGY

Energy is the capacity to do work.

Energy is power integrated over time.

Unit = Joules = watt - second

Common symbol = W  
Symbol = S

## POWER

Power is rate at which work is done.

Energy is transmitted

→ watt = Joules / sec

→ P

# INDUCTANCE

# CAPACITANCE

It is relationship between voltage, current, power and energy.

It is also relationship between voltage, current, power and energy.

Series parallel combination.

it is normally represented in series

The behaviour of inductors is based on

equivalent circuit.

magnetic field. →

The behaviour of



capacitors is based on electric field.



(9)

## SYNCHRONOUS MOTOR :

It is complicated.

Not self starting.

Speed control is not possible

The speed is always synchronous irrespective of the load.

It is used as synchronous condenser for P.D improvement.

## ASYNCHRONOUS MOTOR :

It is simpler particularly in case of cage motor.

→ self starting.

Speed control is possible through difficult.

→ The speed is always less than synchronous but never synchronous.

It can be used as synchronous condenser.