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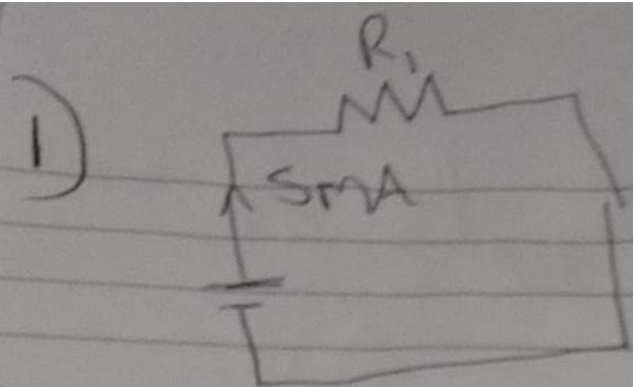
Student ID number: 2004500

Module Title: Electrical & Electronic Principles

Module Code: ACDB4002

Date: 20th May 2022

Time: 1 pm



$$a) R = \frac{V}{I} = \frac{100}{5 \times 10^{-3}}$$

$$R = 20 \text{ k}\Omega$$

$$b) C = \frac{V}{R} = \frac{25}{20 \times 10^3}$$

$$= 0.00125 \text{ A}$$

$$= 1.25 \text{ mA}$$

1) 2a)

$$V = 240V$$

The power rating is 1 kW

$$\text{current rating} = \left(\frac{P}{V} \right)$$

$$I = \frac{1000}{240} = 4.17A$$

Even though 4.17A is required
it would be ideal to have a
5A fuse just in case

b) power rating 23 kW

$$\text{current rating} = \frac{P}{V}$$

$$I = \frac{23000}{240} = 12.5A$$

Even though 12.5A is required
it would be ideal to have a
13A fuse just in case

3)

$$a) Q = 5 \times 10^{-3}$$

$$C = 4 \times 10^{-6}$$

$$Q = CV$$

$$V = \frac{(5 \times 10^{-3})}{(4 \times 10^{-6})} = 1250V$$

b)

$$C = 50pF$$

$$V = 2KV$$

$$Q = CV$$

$$Q = (50 \times 10^{-12}) \times (2 \times 10^3)$$

$$Q = 0.1mc$$



A, B, C are the same
 So $R_A = R_B = R_C = R$

$$\frac{V}{R_A + R_B + R_C}$$

$$= \frac{V}{3R}$$

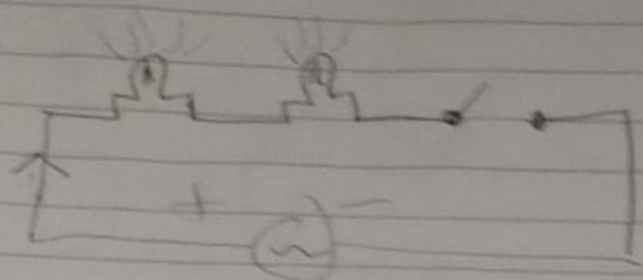
$$V_A = (R) \frac{V}{3R} = \frac{V}{3}$$

$$V_B = (R) \frac{V}{3R} = \frac{V}{3}$$

$$V_C = (R) \frac{V}{3R} = \frac{V}{3}$$

Voltage appears across all
 3 lamps which is $\frac{V}{3}$
 Which = lights connected in
 series glow dim

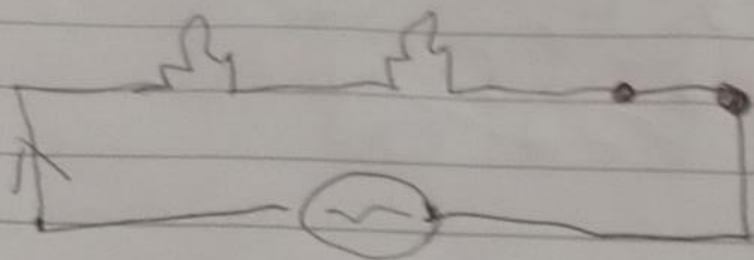
B)



In Short When This happens
With Switch the lights do not
turn on

but

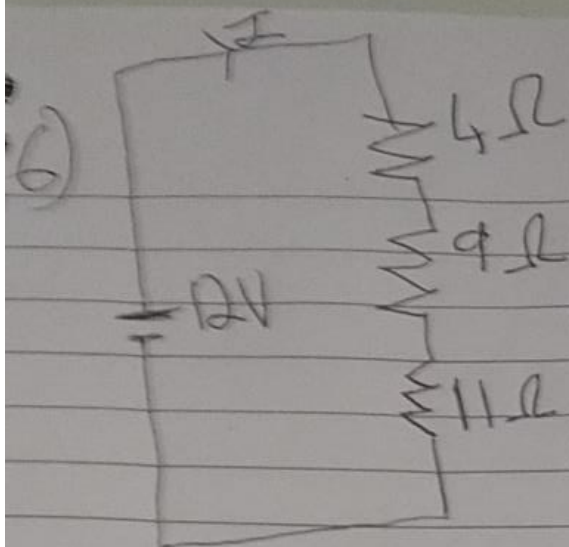
With Switch on



$$R = \frac{V}{2R}$$

$$V = VB = V/2$$

= glows brightly



$$\text{Current} = I = \frac{V}{R_{\text{eq}}}$$

$$I = \frac{12}{4+9+11}$$

$$I = 0.5$$

Current through 9Ω resistor = 0.5A

Voltage across 9Ω resistor = $I \times 9$ [I.R]

$$= 0.5 \times 9$$

$$= 4.5V$$

Power dissipated by 11Ω resistor is

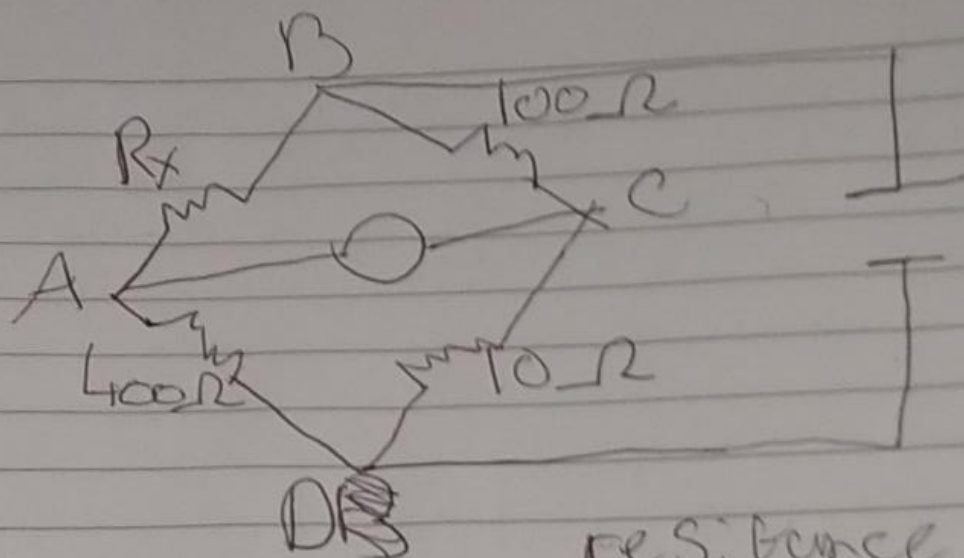
$$P = I^2 R$$

$$P = (0.5)^2 \times 11$$

$$P = 2.75W$$

7)

R_x is unknown



resistance between
 $B \times C = 100\Omega$
 $C \times D = 10$
 $D \times A = 400\Omega$

$$\frac{R_x}{400} = \frac{100}{10}$$

$$R_x = 400\Omega$$