(20) $R = 5\,\Omega$ $I = 2\,A$ $P = ?$

$$P = I^2 R$$
$$= (2)^2 5$$
$$P = 4 \times 5$$
$$\underline{\underline{P = 20\ W}}$$

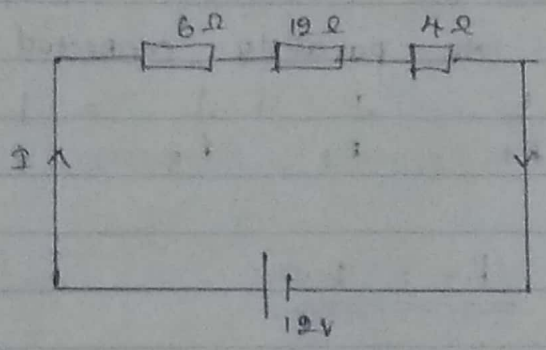
14/06/2023

## Tutorial (6)

Question (1) is in the SAD tutorial section.

(2) Three resistors $6\,\Omega$, $12\,\Omega$, and $4\,\Omega$ are connected in series to an electric supply of 12V.

(i) Calculate the total resistance of these three resistors.

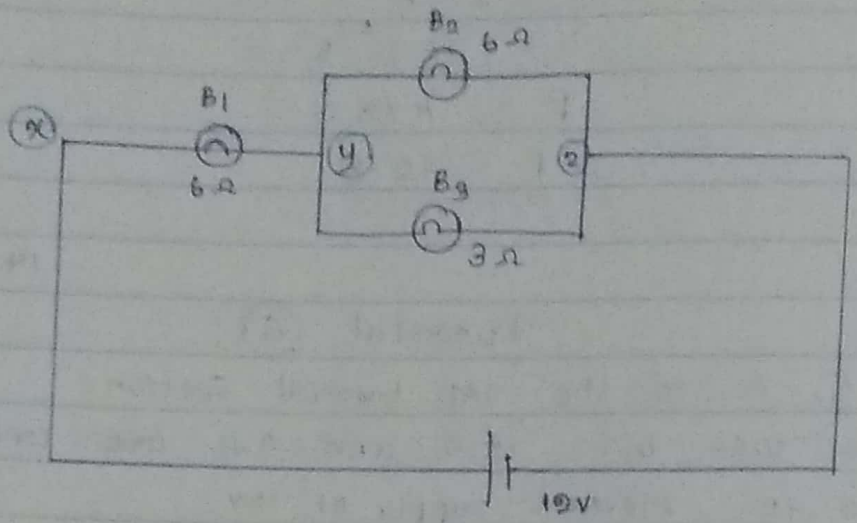



$$R_T = 6 + 12 + 4 = 22\,\Omega$$

(ii) What is the current gain from the electric supply?

$$V = IR$$
$$I = \frac{V}{R} = \frac{12}{22} = \frac{6}{11}\,A = \underline{\underline{0.55\,A}}$$

(8) Three bulbs, $B_1$, $B_2$, $B_3$ are connected to 12V supply as shown in the following diagram.



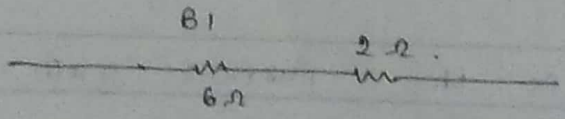

(i) Calculate the total resistance of the two bulbs $B_2$ and $B_3$ (between Y and Z)

$B_2$ and $B_3$ are parallely connected to each other

$$\therefore \frac{1}{R_T} = \frac{1}{R_2} + \frac{1}{R_3} = \frac{1}{6} + \frac{1}{3} = \frac{3}{6} = \frac{1}{2}$$

$$R_T = 2\,\Omega$$

(ii) What is the total resistance between the two points x and z




$$R_T' = 6 + 2\ \Omega$$

$$R_T' = 8\,\Omega$$

(iii) What is the current gained from the electricity supply?

$$V = IR$$

$$I = \frac{V}{R} = \frac{12}{8} = \frac{6}{4} = \frac{3}{2} = 1.5$$

$$I = 1.5\,A$$

(IV) Calculate the potential difference between x and y.

$P = VI$

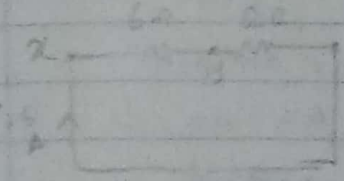
$P = I^2R$

$= (1.5)^2 \times 6$

$= \left(\frac{3}{2}\right)^2 \times 6 = \frac{9}{4} \times 6^3 = \frac{27}{2}$

$P = 13.5\ W$

(V) Calculate the potential difference between y and z.



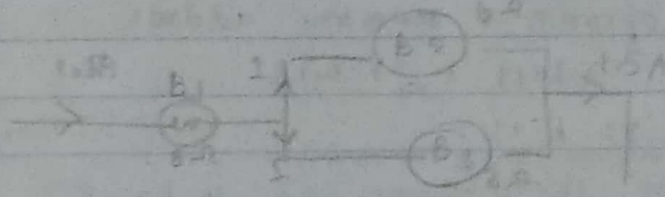
$P = VI$

$= I^2R$

$= \frac{9}{4} \times 2$

$P = 4.5\ W$

(VI) Calculate the current flow through $B_2$ & $B_3$ (VII)



$\frac{1.5}{3} \times 1 = \frac{1}{2} = 0.5\ A$ //

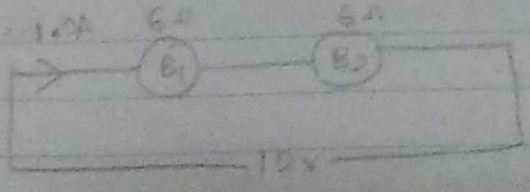
$\frac{1.5}{3} \times 2 = \frac{1}{2} \times 2 = 1\ A$

$I_{B_2} = 0.5A$ //

$I_{B_3} = 1.A$ //.

(VIII) If $B_3$ is removed, then what would be the current going from the electric supply.

$I = \frac{V}{R} = \frac{12}{12} = 1A$ //



If bit = n ⟶

no; of functions = $n^2$

it will allow;

consider ; 4 bit opcode

$n = 4$

$n^2 = 16$

4 bit opcode will allow 16 different functions.

Tutorial (7)

Quick Review Question (1)

- Consider a computer that is used for simple numerical problems it uses 9 bits for an opcode and 25 bits for a memory address.

a) What is the size of its instructions?

39 bits

Instruction size = opcode + memory address.

= 9 bits + 25 bits

= 32 bits.

b) How many different instructions can it have?

$2^9$ = 512 bits.

c) What is the maximum memory size that it can address? $2^{25} / 2^{20} = 2^5 = 32$ M

(Hint: Assume that $2^{20}$ is about 1M).