NAME → MALAY GHOSH.

REG. NO. → 12321607.

ROLL NO. → 67.

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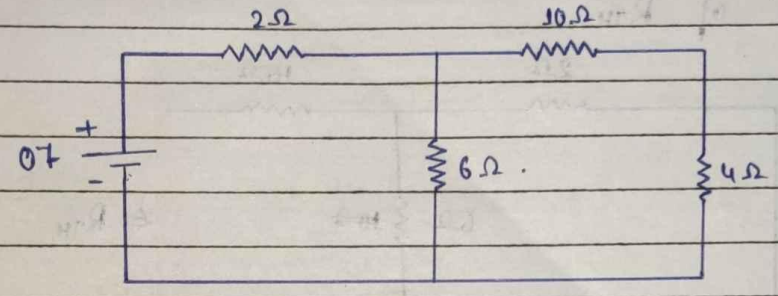
Reg. no. 12321607
Roll no. 67

Assignment Questions :-

Q. 1) Apply the Thevenin and Norton theorem to find the value of current across 4Ω, if the input applied voltage is the last two digits of your registration number.



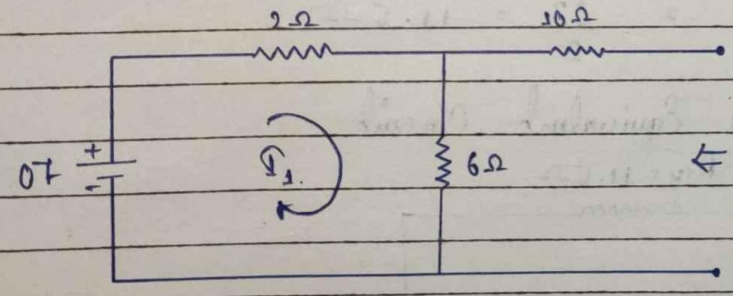
Sol^n :-

Using Thevenin's theorem :-

Step 1) Identify the load resistance (R_L).

$\therefore R_L = 4\Omega$.

Step 2) Remove (R_L) from the above given circuit and calculate I_1 & V_{TH}



Here,

Applying KVL in loop 1 –

$$-7 + 2I_1 + 6I_1 = 0$$

$$\Rightarrow -7 = -8I_1$$

$$\Rightarrow I_1 = \frac{7}{8} A$$

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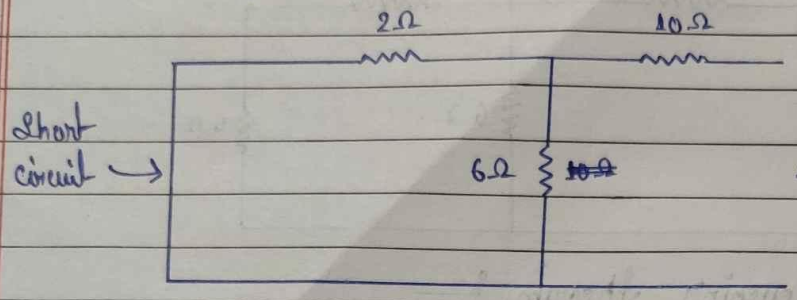
$\therefore V_{TH} = I_1 \cdot R$

$= \frac{7}{4} \times 6^3$

$= \frac{21}{4} = 5.25\ V$

Step 3) Calculation of R_{TH}



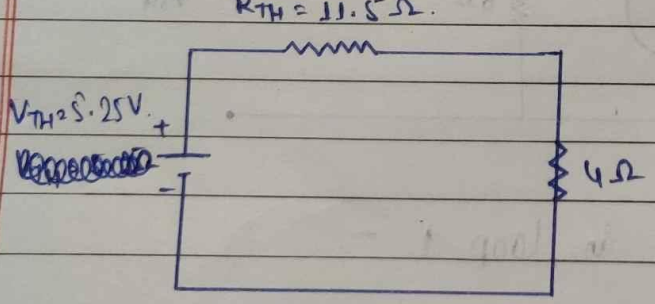
$\therefore R_{TH} = (2 \parallel 6) + 10$

$= \frac{2 \times 6}{2+6} + 10$

$= \frac{3}{2} + 10$

$= \frac{23}{2} = 11.5\ \Omega$

Step 4). Thevenin's Equivalent Circuit.



$\therefore V_{TH} = I \cdot R_{TH}$

$\Rightarrow I = \frac{V_{TH}}{R_{TH}} = \frac{5.25}{(11.5+4)} = \frac{5.25}{15.5}$

$= 0.34\ A$

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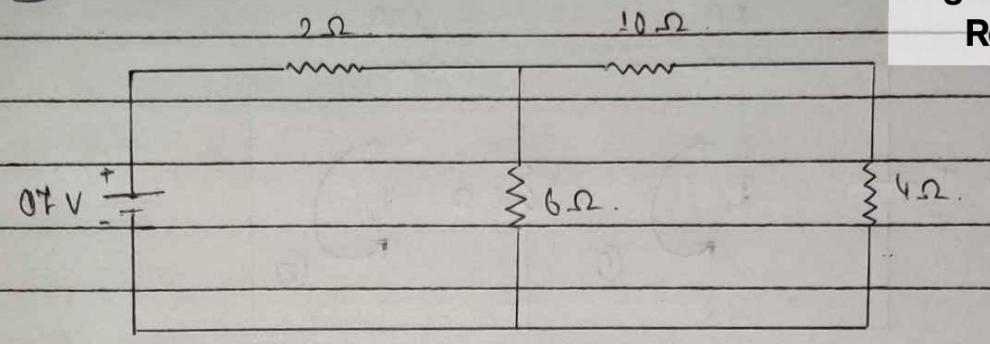
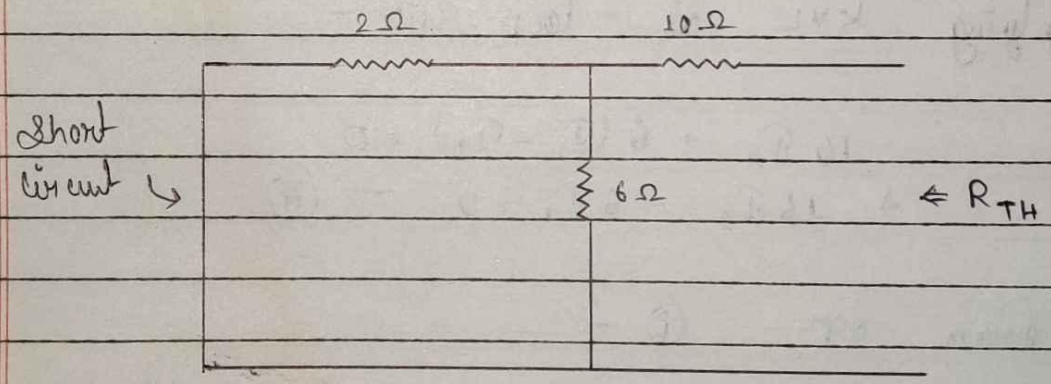
Using Norton's theorem :-



Step 1) Identifying the load resistance (R_L).

$\therefore R_L = 4\Omega.$

Step 2) Temporarily removing the load resistance (R_L) and calculating the value of R_{TH} (Thevenin Equivalent Resistance).



$\therefore R_{TH} = (2 \| 6) + 10.$

$= \left(\frac{2 \times 6}{2+6}\right) + 10.$

$= \frac{3}{2}\cancel{\frac{12}{8}} + 10.$

$= \frac{23}{2} = 11.5\ \Omega.$

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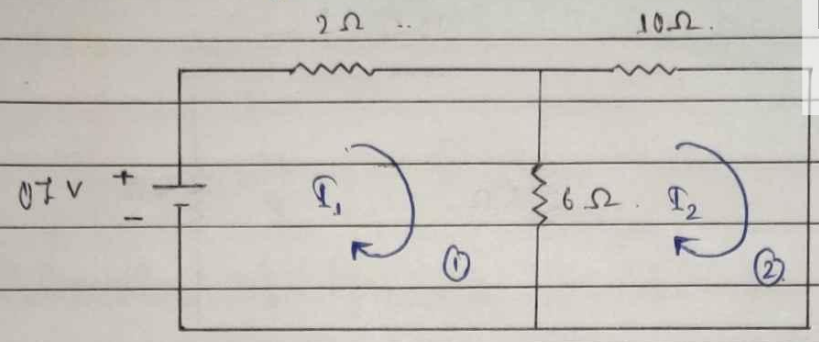
Step 3) Calculation of I_N (Norton current).



Applying KVL at loop ① —

$$-7 + 2I_1 + 6(I_1 - I_2) = 0$$
$$\Rightarrow -7 + 8I_1 - 6I_2 = 0$$
$$\Rightarrow 8I_1 - 6I_2 = 7. \quad -(i).$$

Applying KVL at loop ② —

$$10I_2 + 6(I_2 - I_1) = 0$$
$$\Rightarrow 16I_2 - 6I_1 = 0 \quad -(ii).$$

∴ From eqn (i) —

$$I_1 = \frac{7 + 6I_2}{8}$$

From eqn (ii) —

$$16I_2 - 6\left(\frac{7 + 6I_2}{8}\right) = 0.$$

$$\Rightarrow 16I_2 - \frac{3(7 + 6I_2)}{4} = 0.$$

$$\Rightarrow 16I_2 - \frac{(21 + 18I_2)}{4} = 0$$

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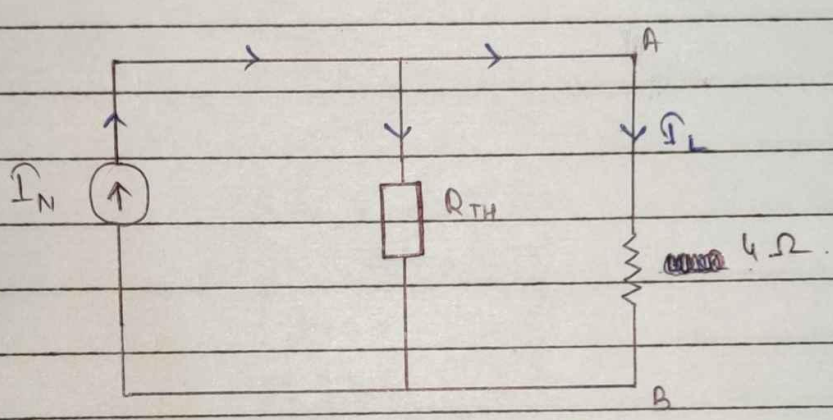
$$\Rightarrow \frac{64I_2 - 21 - 18I_2}{4} = 0.$$

$$\Rightarrow 46I_2 = 21.$$

$$\Rightarrow I_2 = \frac{21}{46} = 0.45\ A. = I_N.$$

Ans 4). Norton's equivalent Circuit.



By Current Division Rule,

$$I_L = I_N \times \frac{R_{TH}}{R_{TH} + 4}.$$

$$= \frac{0.45 \times 11.5}{11.5 + 4}$$

$$= \frac{5.175}{15.5}$$

$$= 0.33\ A.$$

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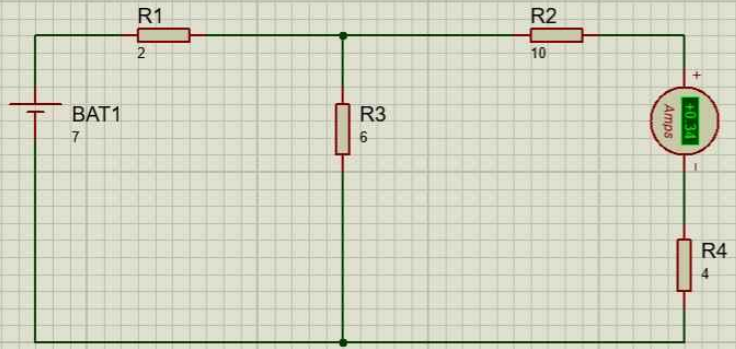

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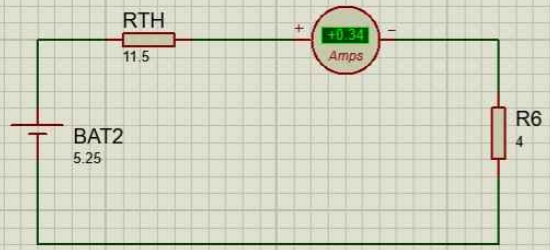
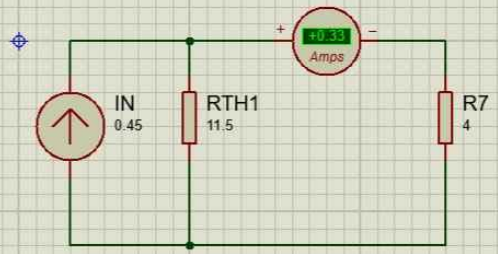
SECTION:- K23GD



THEVENIN'S THEOREM



NORTAN'S THEOREM

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Q.) Implementation of a Boolean function using 4:1 multiplexer on proteus software. The Minterms will be implementation of Decimal to Octal conversion of your registration number.

Soln

Registration number = $(12321607)_{10}$.

Into Octal :-

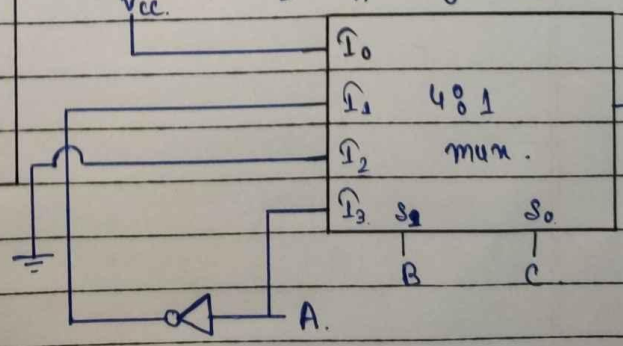
8	12321607	
8	1540200	= 7
8	192525	= 0.
8	24068	= 1
8	3008	= 4
8	376	= 0
8	47	= 0
	5	= 7.

∴ Octal number = $(57004107)_8$.

A	B	C	Y
0	0	0	1
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

$Y(A,B,C) = \Sigma(1,0,4,7)$

A \ BC	I_0 00	I_1 01	I_2 10	I_3 11
$(\bar{A}) \rightarrow 0$	(0)	(1)	2	3
$(A) \rightarrow 1$	(4)	5	6	(7)
	1	$\bar{A}$	0	A



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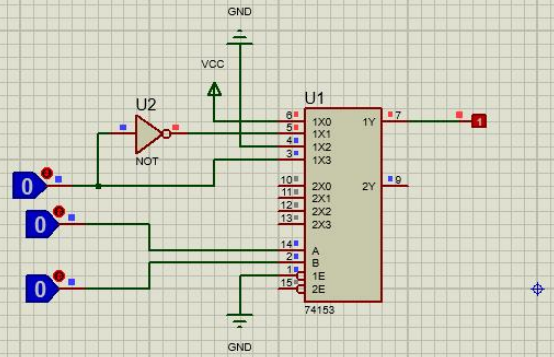

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Truth Table

A	B	C	Y(0, 1, 4, 7)
0	0	0	1
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

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sketch_nov12a

```
const int ProxSensor=7;
const int led = 10;

void setup() {
  pinMode(led, OUTPUT);
  pinMode(ProxSensor, INPUT);
  Serial.begin(9600);

}

void loop() {
if(digitalRead(ProxSensor)==HIGH)
    {
      digitalWrite(led,HIGH);
      Serial.println("MALAY GHOSH..12321607")
      }
else
{
  digitalWrite(led,LOW);
  Serial.println("Roll no. 67");
}
}
```

1

Arduino Uno

17°C Haze

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