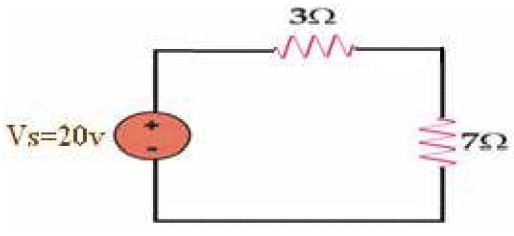
Question No: 4 (Marks: 1) – Please choose one

Using voltage divider in the figure below Voltage drop across 3Ω will be



► 20v

► 14v

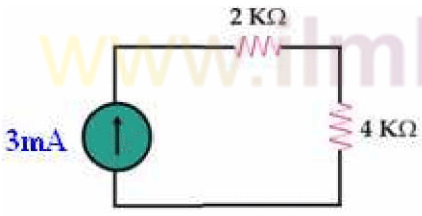
► 6v

V=R/Rt*Vs
= 3/10*20 = 6v = Answer

► 7v

Question No: 5 (Marks: 1) – Please choose one

In the given series fig. the total voltage of circuit is



► 6V

► 12V

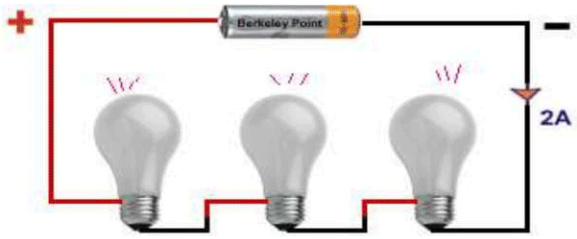
► 18V

V=IR
= 3Ma * 4+2 = 3Ma * 6
= 18V= Ans….

► 10V

Question No: 6 (Marks: 1) – Please choose one

In given circuit power dissipated across each bulb is 20w.What would be the resistance of each bulb.



► 5Ω **P=V*I**
20 = V*2A
20/2 = V
V=10v
So,
R=V/I = 10/2 = 5 ohm =Ans.....

► 10Ω

► 40Ω

► 20Ω

Question No: 7 (Marks: 2)

What is the unit of capacitance and Inductance?

Answer:
The SI unit of capacitance is the farad; 1 farad = 1 coulomb per volt.
The unit of inductance is the henry (H) named after American scientist and magnetic researcher Joseph Henry. 1 H = 1 Wb/A

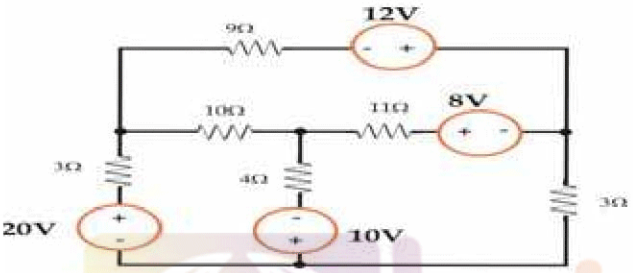
Question No: 8 (Marks: 2)

Define KIRCHHOFF'S VOLTAGE LAW (KVL):

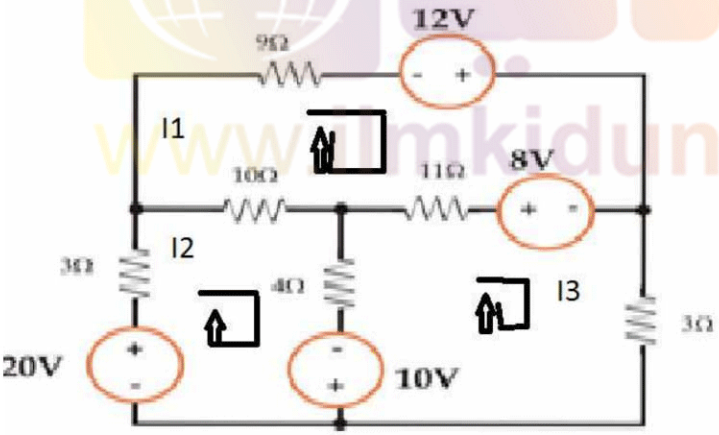
Answer:
Kirchhoff's Voltage Law (or Kirchhoff's Loop Rule) is a result of the electrostatic field being conservative. It states that "the total voltage around a closed loop must be zero". If this were not the case, then when we travel around a closed loop, the voltages would be indefinite. So, ∑V=0

Question No: 9 (Marks: 3)

Draw and label loop currents for circuit.write kvl for any one loop equation.



Solution:
Circuit will be redrawn as

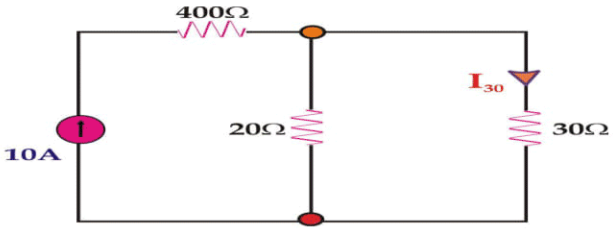


KVL for loop 1 is

$$9I_1 + 1_2 + 8 + 11(I_1 - I_3) + 10(I_1 - I_2) + 9I_1$$

Question No: 10 (Marks: 5)

You are given the circuit Use Current Division Rule directly to find I_{30}.



Solution:

Formula is

$I_1 = R_2/R_1 + R_2$

AS we see that 30 ohm is in parallel with 20 ohm, So the resistance will become 12 ohm..

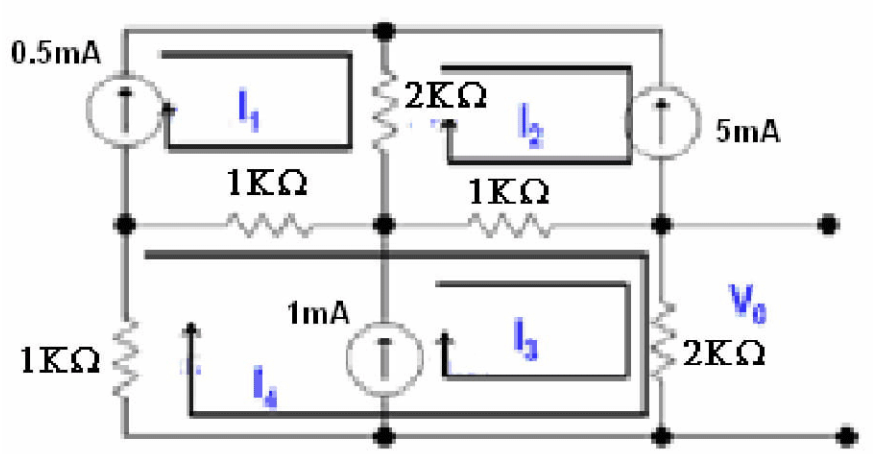
Now,

$U \sin g \;\; formula, \; we \;\; have$

$$I_{30} = \frac{400}{400+12} \times 10$$
$$= \frac{4000}{412}$$
$$= 9.7A$$

Question No: 11 (Marks: 5)

Determine the value **I4** for the given network.



Solution:

$I_1 = 0.5mA,$

$I_2 = -5mA,$

$I_3 = 1mA$

$FOR\ I_4$

$1k(I_4 - I_1) + 1K(I_4 - I_2) + 1KI_3 + 2KI_3 + 1KI_4 = 0$

$= 2KI_4 - 1KI_2 + 3KI_3 = 0$

$PUTTING\ I\ VALUES$

$= 2KI_4 - 5 + 3 = 0$

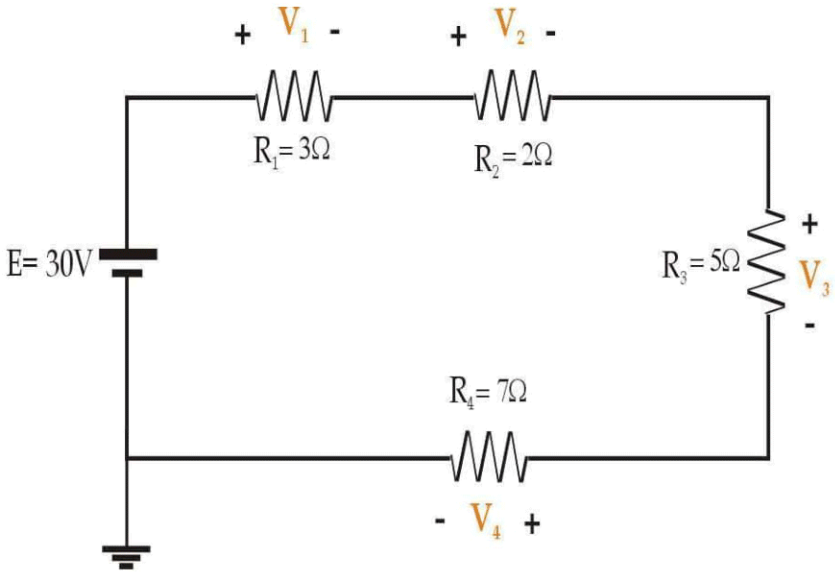
$= 2KI_4 - 2 = 0$

$= I_4 = \frac{2}{2} = 1mA....$

Question No: 12 (Marks: 10)

If 1.76A current is flowing through circuit

Calculate the power dissipated by R_1, R_2 ,R_3 and R_4Determine the power delivered by the source, Write each step of the calculation to get maximum marks and also mention the units of each derived value.



Solution:

I=1.76 A

As the formula for power delivered by source is

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

So,

$$P = \frac{30^2}{17} = \frac{900}{17}$$

$$P = 52.94\ Watts$$

Now Power dissipated in each resistor will:

$$P = I^2 R$$

$$P_1 = (1.76)^2 \times 3$$

$$P_1 = 9.2 watts$$

$$P_2 = (1.76)^2 \times 2$$

$$= 6.19\ watts$$

$$P_3 = (1.76)^2 \times 5$$

$$= 15.48\ watts$$

$$P_4 = (1.76)^2 \times 7$$

$$= 21.68\ watts$$