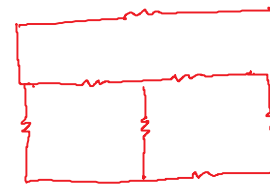


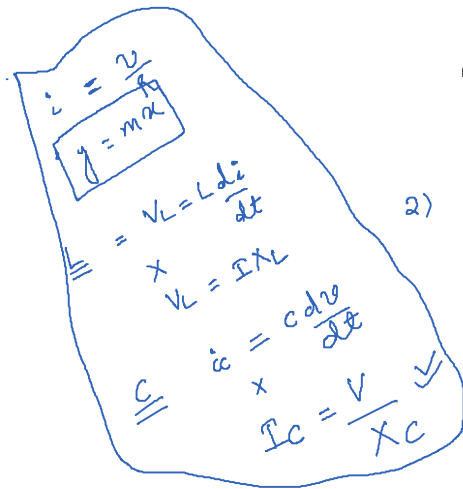
D.C Circuit



(1) Active element (Source)

Active elements are those which supplies electrical energy to the ckt.

ex: Current Source
Voltage Source



2)

Linear element

If the current passing through an element changes linearly w.r.t the applied voltage, then it is called a linear element

ex: R, L, C

Passive element (Load)

Passive elements are those which receives electrical energy from the ckt

ex: R, L, C

Non linear element

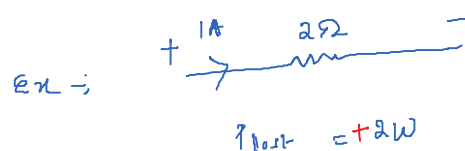
If the current passing through an element doesn't change linearly w.r.t applied voltage, then it is called a non linear element.

ex: Diode.

3)

Bilateral Element

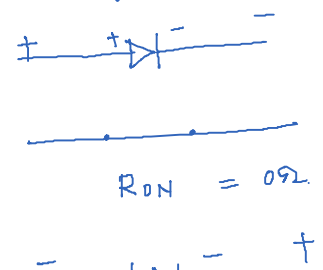
Bilateral elements are those whose properties are independent of voltage polarities and current direction

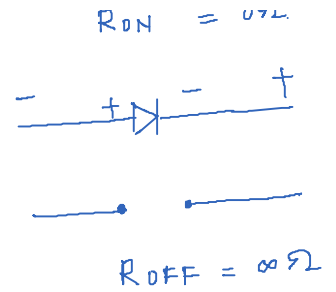
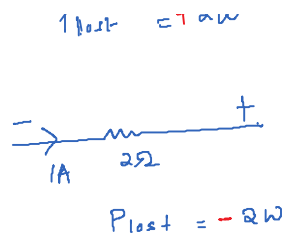


Unilateral element

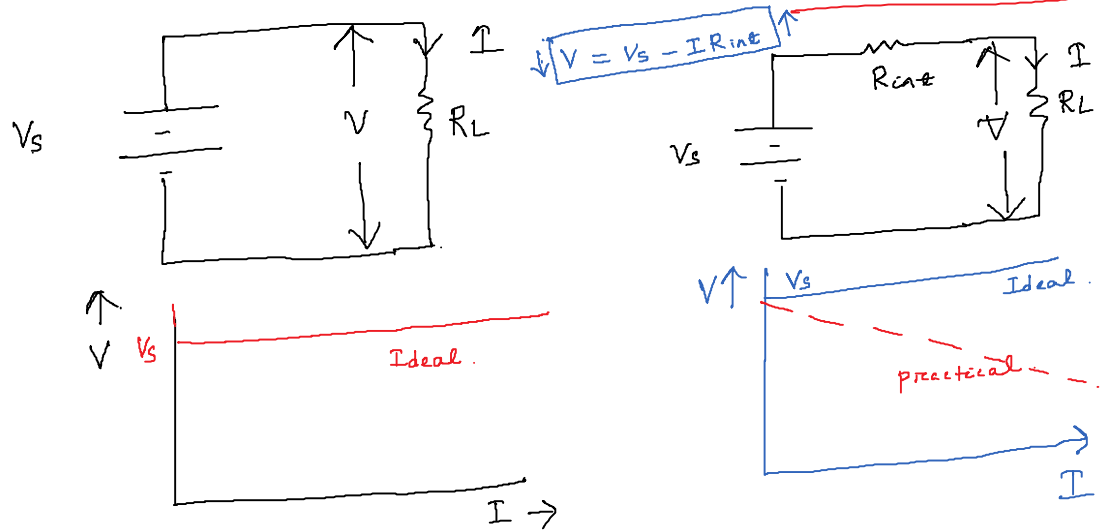
Unilateral elements are those whose property changes with voltage polarities and current direction.

ex:





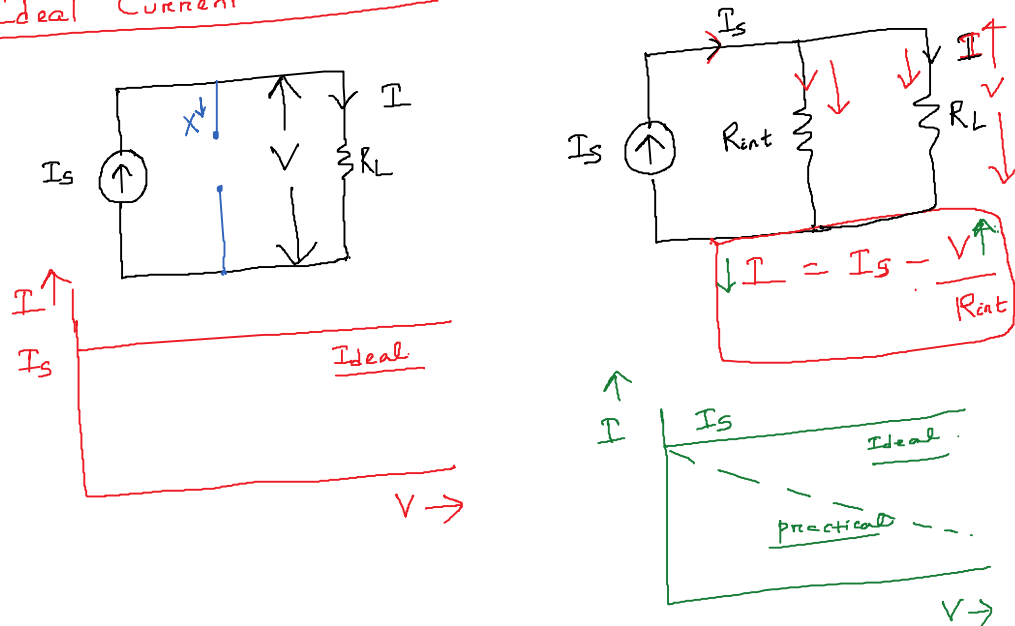
(4) Ideal Voltage Source ($I_R = 0$) Practical Voltage Source

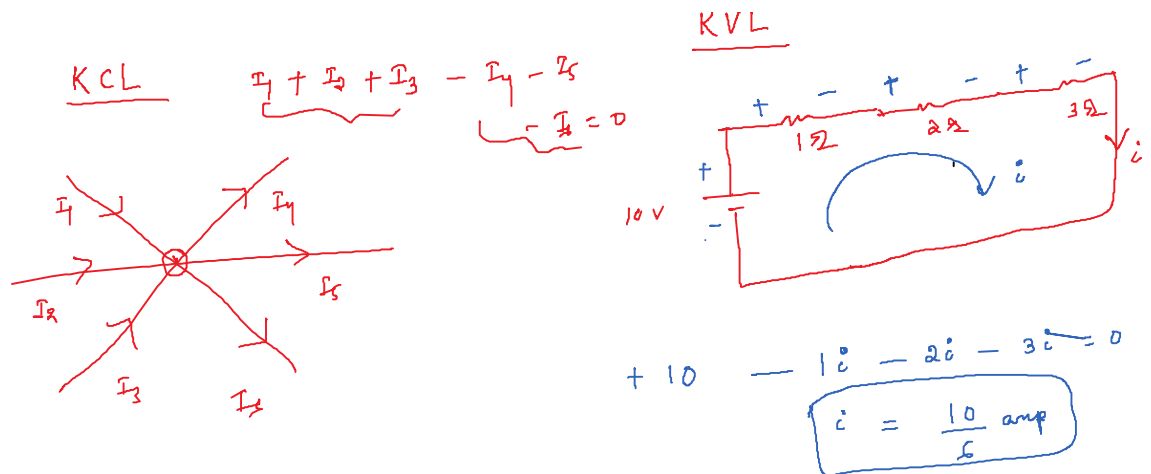


Ideal voltage is also called constant voltage source which maintains a constant voltage irrespective of load current.

5) Ideal Current Source ($I_R = \infty$) Practical Current Source

Ideal current source is also called constant current source which maintains a constant current irrespective of load voltage

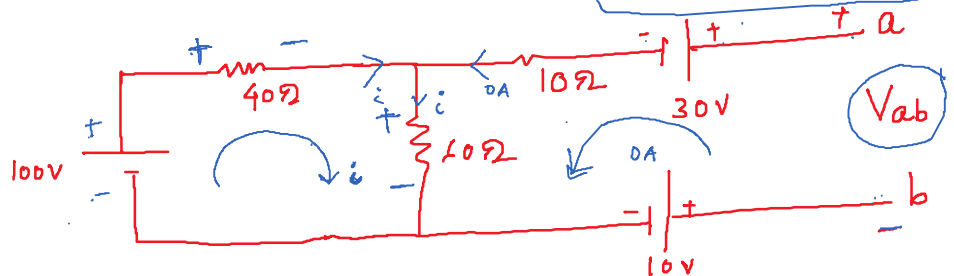




$$V_{2\Omega} = \frac{10}{6} \times 2$$

$$= \frac{10}{3} \text{ V}$$

Q.1



$$100 - 40i - 10i = 0$$

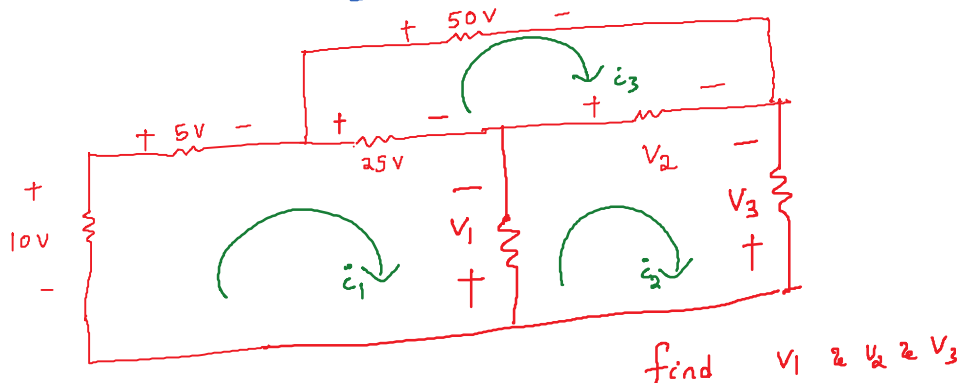
$$i = 1 \text{ A}$$

$$V_{ab} = ?$$

$$V_{ab} - 30 - 0 - 10 \times 1 + 10 = 0$$

$$V_{ab} = 30 + 10 - 10 = 30 \text{ V}$$

Q.2



find V_1 & V_2 & V_3

$$-V_1 - V_2 + V_3 = 0$$

$$V_2 = V_1 + V_2$$

$$10 - 5 - 25 + V_1 = 0$$

$$V_1 = 20 \text{ V}$$

$$-V_1 - V_2 = 0$$

$$V_3 = V_1 + V_2$$

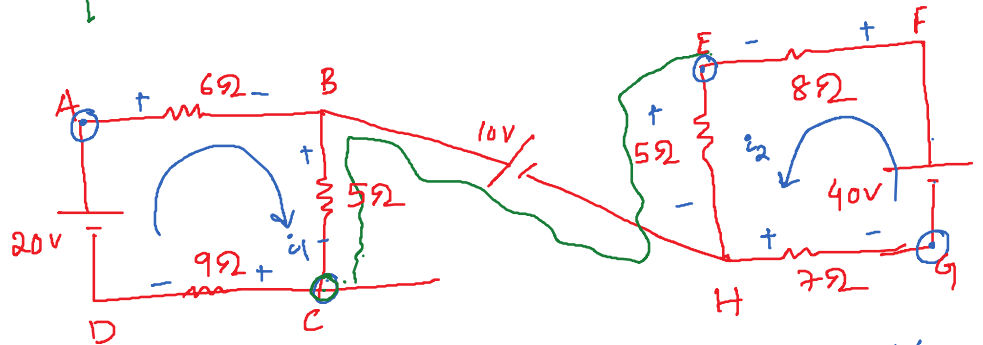
$$V_3 = 45V$$

$$V_1 = 20V$$

$$-50 + V_2 + 25 = 0$$

$$V_2 = 25V$$

Q.3



$$V_{CE} = V_C - V_E$$

$$20 - 6i_1 - 5i_1 - 9i_1 = 0$$

$$i_1 = 1A$$

Find V_{CE} & V_{AG} ?

$$40 - 8i_2 - 5i_2 - 7i_2 = 0$$

$$i_2 = 2A$$

$$V_C + 5i_1 - 10 + 5i_2 - V_E = 0$$

$$V_{CE} = -5i_1 + 10 - 5i_2$$

$$= -5 + 10 - 10$$

$$V_{CE} = -5V$$

$$V_{AG} = 30V$$