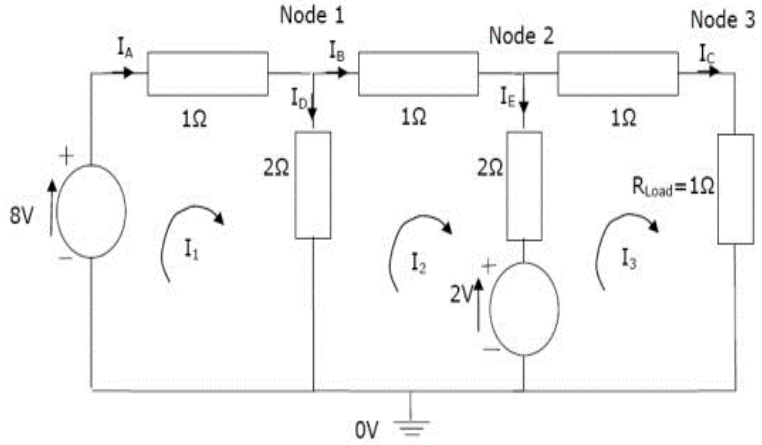
Q- Two ideal constant voltage sources and six resistors are connected in a circuit as shown. The right most resistor is the load. Using mesh analysis calculate currents I_1, I_2 and I_3.

i) In a closed loop (mesh) the net potential drop will be zero.
ii) Due to a battery the potential is gained, hence potential drop is taken negative
iii) The potential drop across a resistance is given by R*I



Now writing mesh equations for the three loops respectively we get

For the first loop

$$-8 + 1*I_1 + 2*(I_1-I_2) = 0$$

Or $3\ I_1 - 2\ I_2 = 8$ ---------- (1)

For second loop

$$-2*(I_1-I_2) + 1*I_2 + 2\ (I_2 - I_3) + 2 = 0$$

Or $2\ I_1 - 5\ I_2 + 2\ I_3 = 2$ ---------- (2)

For third loop

$$-\ 2\ (I_2 - I_3) + 1\ I_3 + 1\ I_3 - 2 = 0$$

Or $-\ 2\ I_2 + 4\ I_3 = 2$ ---------- (3)

Solving the three equations we get

$I_1 = 3.75$ A; $I_2 = 1.625$ A; $I_3 = 1.312$ A