

Current through the  $3\Omega$  resistor -

$$i_2 = \frac{V}{3} = \frac{-0.6}{3} = 0.2A$$

Current through the  $2\Omega$  resistor

$$i_1 = \frac{V_2}{2} = \frac{18.4}{2} = 9.2A$$

At node 1; Using KCL

$$6mA = i_1 + i_2$$

$$6mA = \frac{V_1 - 0}{6} + \frac{V_1 - V_2}{3}$$

$$36 = V_1 + 6(V_1 - V_2)$$

$$36 = 7V_1 - 6V_2$$

$$36 = 7V_1 - 6V_2 \dots (i)$$

At node 2

$$i_2 - i_3 + i_4$$

$$V_1 - V_2 = 9mA + \frac{V_2 - 0}{12}$$

$$12(V_1 - V_2) = 98 + V_2$$

$$98 = 12V_1 - 12V_2 - V_2$$

$$48 = 12V_1 - 13V_2 \dots (ii)$$

Solving  $V_1$  &  $V_2$  simultaneously, we have

$$V_1 = 9.5V \text{ \& } V_2 = 5.1V$$

$\therefore$  Current through the  $6\Omega$  resistor

$$i_1 = \frac{V_1}{6} = \frac{9.5}{6} = 1.58A; \quad i_2 = \frac{V_1 - V_2}{3} = \frac{9.5 - 5.1}{3} = 1.47A$$

Current through the  $12\Omega$  resistor

$$i_4 = \frac{V_2}{12} = \frac{5.1}{12} = 0.425A$$

$$\therefore V_1 = 9.5V, \quad V_2 = 5.1V$$

$$i_1 = 1.58A, \quad i_4 = 0.425A$$