Alternatingcurrentcircuitscorcoransolutionpdfdownload

Chapter–1

Newtwork Concepts

1.1 Given

There branch voltages are, $v_{b1} = (-2 + 3i_{b2})$

$v_{b2} = (-4 + 2i_{b2})$

$v_{b3} = 2i_{b3}$

(a) Using mesh analysis (mesh – 1)

$i_2 (2 + 2) + i_1 (2) = 4$

or, $i_2 (4) + i_1 (2) = 4$ ... ... (i)

Using mesh analysis, (mesh – 2)

$i_1 (2 + 2 + 1) + i_2 (2) = 2$

or, $5i_1 + 2i_2 = 2$ ... ... (ii)

If i_{b1}, i_{b2}, i_{b3} are the independent variable.

$i_2 = i_{b2}$

$i_{b3} = i_1 + i_2$ or, $i_2 = i_{b3} - i_{b1}$

$i_{b1} = i_1$

So equation (i) and (ii) can be written as,

$2i_2 + i_1 = 2$

or, $2i_{b2} + i_{b1} = 2$

and $5i_1 + 2i_2 = 2$

or, $5i_{b1} + 2i_{b2} = 2$

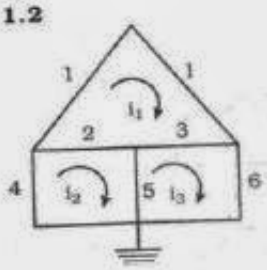
Thus,

$i_{b3} = i_1 + i_2$

$2i_{b2} + i_{b1} = 2$

$5i_{b1} + 2i_{b2} = 2$

1.2



Given, branch resistance.

$R_{b1} = 2$, $R_{b2} = 2$, $R_{b3} = 3$, $R_{b4} = 4$

$R_{b5} = 5$, $R_{b6} = 6$ ohms

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