Engineering Analysis & Numerical Methods

$i = 1$

$100 + 0 + U_3 + U_2 - 4U_1 = 0$ ..... (1)

$i = 2$

$100 + U_1 + U_4 + U_1 - 4U_2 = 0$ ..... (2)

$i = 3$

$U_1 + 0 + U_5 + U_5 - 4U_3 = 0$ ..... (3)

$i = 4$

$U_2 + U_3 + U_6 + U_3 - 4U_4 = 0$ ..... (4)

$i = 5$

$U_3 + 0 + 0 + U_6 - 4U_5 = 0$ ..... (5)

$i = 6$

$U_4 + U_5 + 0 + U_5 - 4U_6 = 0$ ..... (6)

$$\begin{bmatrix} -4 & 1 & 1 & 0 & 0 & 0 \\ 2 & -4 & 0 & 1 & 0 & 0 \\ 1 & 0 & -4 & 1 & 1 & 0 \\ 0 & 1 & 2 & -4 & 0 & 1 \\ 0 & 0 & 1 & 0 & -4 & 1 \\ 0 & 0 & 0 & 1 & 2 & -4 \end{bmatrix} \begin{Bmatrix} U_1 \\ U_2 \\ U_3 \\ U_4 \\ U_5 \\ U_6 \end{Bmatrix} = \begin{Bmatrix} -100 \\ -100 \\ 0 \\ 0 \\ 0 \\ 0 \end{Bmatrix}$$