

Assignment 30

$$\begin{aligned} \bar{1}_1 + \bar{1}_2 - 2\bar{1}_3 + \bar{1}_4 + 3\bar{1}_5 - \bar{1}_6 &= 4 \quad \text{--- (1)} \\ 2\bar{1}_1 - \bar{1}_2 + \bar{1}_3 + 2\bar{1}_4 + \bar{1}_5 - 3\bar{1}_6 &= 20 \quad \text{--- (2)} \\ \bar{1}_1 + \bar{1}_2 - 3\bar{1}_3 - \bar{1}_4 + 2\bar{1}_5 + \bar{1}_6 &= -15 \quad \text{--- (3)} \\ -3\bar{1}_1 + 2\bar{1}_2 + 2\bar{1}_3 + 3\bar{1}_4 + \bar{1}_5 + 3\bar{1}_6 &= 16 \quad \text{--- (4)} \\ 4\bar{1}_1 + 3\bar{1}_2 + \bar{1}_3 - 6\bar{1}_4 - 3\bar{1}_5 - 2\bar{1}_6 &= -27 \quad \text{--- (5)} \end{aligned}$$

\therefore Equation (1) becomes the pivot equation
 $2[\bar{1}_1 + \bar{1}_2 - 2\bar{1}_3 + \bar{1}_4 + 3\bar{1}_5 - \bar{1}_6 = 4] = 2\bar{1}_1 + 2\bar{1}_2 - 4\bar{1}_3 + 2\bar{1}_4 + 6\bar{1}_5 - 2\bar{1}_6 = 8$

$$\begin{aligned} [\bar{1}_1 + \bar{1}_2 - 2\bar{1}_3 + \bar{1}_4 + 3\bar{1}_5 - \bar{1}_6 = 4] &= [\bar{1}_1 + \bar{1}_2 - 2\bar{1}_3 + \bar{1}_4 + 3\bar{1}_5 - \bar{1}_6 = 4] \\ 5[\bar{1}_1 + \bar{1}_2 - 2\bar{1}_3 + \bar{1}_4 + 3\bar{1}_5 - \bar{1}_6 = 4] &= 5\bar{1}_1 + 5\bar{1}_2 - 10\bar{1}_3 + 5\bar{1}_4 + 15\bar{1}_5 - 5\bar{1}_6 = 20 \end{aligned}$$

$$\begin{aligned} -3[\bar{1}_1 + \bar{1}_2 - 2\bar{1}_3 + \bar{1}_4 + 3\bar{1}_5 - \bar{1}_6 = 4] &= -3\bar{1}_1 - 3\bar{1}_2 + 6\bar{1}_3 - 3\bar{1}_4 - 9\bar{1}_5 + 3\bar{1}_6 = -12 \\ 4[\bar{1}_1 + \bar{1}_2 - 2\bar{1}_3 + \bar{1}_4 + 3\bar{1}_5 - \bar{1}_6 = 4] &= 4\bar{1}_1 + 4\bar{1}_2 - 8\bar{1}_3 + 4\bar{1}_4 + 12\bar{1}_5 - 4\bar{1}_6 = 16 \end{aligned}$$

Subtracting equation,

$$2\bar{1}_1 + 2\bar{1}_2 - 4\bar{1}_3 + 2\bar{1}_4 + 6\bar{1}_5 - 2\bar{1}_6 = 8$$

$$\Rightarrow -2\bar{1}_1 - \bar{1}_2 + \bar{1}_3 + 2\bar{1}_4 + \bar{1}_5 - 3\bar{1}_6 = 20 \quad \text{--- (2)}$$

$$\begin{aligned} \Rightarrow 0 - 3\bar{1}_2 + 5\bar{1}_3 + 0 - 5\bar{1}_5 + \bar{1}_6 &= 12 \quad \text{--- (2)} \\ \bar{1}_1 + 3\bar{1}_2 - 3\bar{1}_6 - \bar{1}_4 + 2\bar{1}_5 + \bar{1}_6 &= -15 \\ -\bar{1}_1 + \bar{1}_2 - 2\bar{1}_6 + \bar{1}_4 + 3\bar{1}_5 - \bar{1}_6 &= 4 \\ \Rightarrow 0 + 2\bar{1}_2 - \bar{1}_3 - 2\bar{1}_4 - \bar{1}_5 + 2\bar{1}_6 &= -19 \quad \text{--- (3)} \end{aligned}$$

$$-3 \begin{vmatrix} -3 & 1_2 + 5 \end{vmatrix} 1_3 - 5 \begin{vmatrix} 1_5 - 1_6 = 12 \end{vmatrix} = -3 \begin{vmatrix} 1_2 + 5 \end{vmatrix} 1_3 - 5 \begin{vmatrix} 1_5 - 1_6 = 12 \end{vmatrix}$$

$$-2 \begin{vmatrix} -3 & 1_2 + 5 \end{vmatrix} 1_3 - 5 \begin{vmatrix} 1_5 - 1_6 = 12 \end{vmatrix} = 1_2 - 1_3 + 10 \begin{vmatrix} 1_3 + 10 \end{vmatrix} 1_5 + 2 \begin{vmatrix} 1_5 - 1_6 = 12 \end{vmatrix}$$

$$-1 \begin{vmatrix} -3 & 1_2 + 5 \end{vmatrix} 1_3 - 5 \begin{vmatrix} 1_5 - 1_6 = 12 \end{vmatrix} = -1_2 + 5 \begin{vmatrix} 1_3 - 5 \end{vmatrix} 1_5 - 1 \begin{vmatrix} 1_5 - 1_6 = 4 \end{vmatrix}$$

(c)

$$\begin{aligned}
 & 2I_2 - 4I_3 + 6I_4 + 10I_5 - 0I_6 = 0.8 \\
 & -2I_2 - 10I_3 + 10I_4 + 2I_5 + 2I_6 = -8 \\
 & -2I_3 + 6I_4 + 20I_5 - 2I_6 = 36 \quad \dots (5)
 \end{aligned}$$

(5)

$$\begin{aligned}
 & -I_2 + 7I_3 - 10I_4 - 15I_5 + 2I_6 = -43 \\
 & -I_2 + 5I_3 + 8I_4 - 5I_5 - 1I_6 = 4 \\
 & 0 + 22I_3 - 10I_4 - 14I_5 + 7I_6 = -47 \quad \dots (6)
 \end{aligned}$$

Equation (3) - 9th second for proof equation

(6)

$$\begin{aligned}
 & 12I_7 + 7I_8 - 2I_9 - 13I_{10} + 4I_{11} = -11 \\
 & = 4I_8 - 24I_9 - 52I_{10} + 16I_{11} = -122
 \end{aligned}$$

$$\begin{aligned}
 & -2I_7 + 7I_8 - 2I_9 - 13I_{10} + 4I_{11} = -11 \\
 & = -2I_8 + 4I_9 + 26I_{10} - 5I_{11} = 22
 \end{aligned}$$

$$\begin{aligned}
 & 22I_7 + 7I_8 - 2I_9 - 13I_{10} + 4I_{11} = 11 \\
 & = 22I_8 - 44I_9 - 28I_{10} + 8I_{11} = 242
 \end{aligned}$$

Substituting equation

$$\begin{aligned}
 & 4I_8 - 6I_9 - 8I_{10} + 7I_{11} = -35 \\
 & -4I_8 - 24I_9 - 52I_{10} + 16I_{11} = -182 \\
 & 0 - 2.5714I_9 - 0.5714I_{10} + 4.6714I_{11} = -16.1429
 \end{aligned}$$

$$\begin{aligned}
 & 8I_8 + 6I_9 + 20I_{10} - 2I_{11} = 36 \\
 & -2I_8 + 4I_9 + 26I_{10} - 5I_{11} = 22 \\
 & 0 + 5.42857I_9 + 5.42857I_{10} - 0.28571I_{11} =
 \end{aligned}$$

(3)

$$\begin{aligned}
 & 22I_8 - 10I_9 - 40I_{10} + 7I_{11} = -47 \\
 & -22I_8 - 44I_9 - 28I_{10} + 8I_{11} = -242
 \end{aligned}$$

$$\begin{aligned}
 & 0 - 3.71428I_9 + 0.28571I_{10} - 1.85714I_{11} =
 \end{aligned}$$

Equation (4) is then the pivot equation

$$\begin{aligned} & -2.1111 \begin{bmatrix} -2.5714 \\ 14 \\ -0.5714 \\ 15 \end{bmatrix} + 4.7142 \begin{bmatrix} 16 \\ -16.1429 \\ 16.1429 \end{bmatrix} \\ & = 25 \begin{bmatrix} 25 \\ 57 \\ 14 \\ 15 \end{bmatrix} - 0.5714 \begin{bmatrix} 16 \\ 15 \end{bmatrix} + 4.7142 \begin{bmatrix} 16 \\ 15 \end{bmatrix} = 16.1429 \\ & = 5.42857 \begin{bmatrix} 14 \\ 15 \end{bmatrix} + 1.2063 \begin{bmatrix} 15 \\ 16 \end{bmatrix} - 9.9521 \begin{bmatrix} 16 \\ 15 \end{bmatrix} = 34.0793 \end{aligned}$$

$$\begin{aligned} & 1.4444 \begin{bmatrix} -2.5714 \\ 14 \\ -0.5714 \\ 15 \end{bmatrix} + 4.7142 \begin{bmatrix} 16 \\ 15 \end{bmatrix} = 16.1429 \\ & = -3.7142 \begin{bmatrix} 14 \\ 15 \end{bmatrix} - 0.8253 \begin{bmatrix} 15 \\ 16 \end{bmatrix} + 6.8094 \begin{bmatrix} 16 \\ 15 \end{bmatrix} = 23.3177 \end{aligned}$$

Subtracting equation

$$\begin{aligned} & 5.42857 \begin{bmatrix} 14 \\ 15 \end{bmatrix} + 5.42857 \begin{bmatrix} 15 \\ 16 \end{bmatrix} - 0.2857 \begin{bmatrix} 16 \\ 15 \end{bmatrix} = 32.8571 \\ & - [5.42857 \begin{bmatrix} 14 \\ 15 \end{bmatrix} + 1.2063 \begin{bmatrix} 15 \\ 16 \end{bmatrix} - 9.9521 \begin{bmatrix} 16 \\ 15 \end{bmatrix}] = 34.0793 \\ & 0.14 + 4.2223 \begin{bmatrix} 15 \\ 16 \end{bmatrix} + 9.6663 \begin{bmatrix} 16 \\ 15 \end{bmatrix} = -1.2222 \end{aligned}$$

$$\begin{aligned} & -3.7142 \begin{bmatrix} 14 \\ 15 \end{bmatrix} + 0.2837 \begin{bmatrix} 14 \\ 15 \end{bmatrix} - 1.8571 \begin{bmatrix} 16 \\ 15 \end{bmatrix} = -12.4286 \\ & - [3.7142 \begin{bmatrix} 14 \\ 15 \end{bmatrix} - 0.8253 \begin{bmatrix} 15 \\ 16 \end{bmatrix} + 6.8094 \begin{bmatrix} 16 \\ 15 \end{bmatrix}] = 23.3177 \\ & 0.14 + 1.1111 \begin{bmatrix} 15 \\ 16 \end{bmatrix} - 8.6667 \begin{bmatrix} 16 \\ 15 \end{bmatrix} = 10.8889 \end{aligned}$$

Equation 5'' then becomes the pivot equation:

$$\begin{aligned} & 0.2632 \begin{bmatrix} 4.2223 \\ 15 \end{bmatrix} + 9.6663 \begin{bmatrix} 16 \\ 15 \end{bmatrix} = -1.2222 \\ & = 1.1111 \begin{bmatrix} 15 \\ 16 \end{bmatrix} + 2.5442 \begin{bmatrix} 16 \\ 15 \end{bmatrix} = -0.32168 \end{aligned}$$

$$\begin{aligned} & \Rightarrow 1.1111 \begin{bmatrix} 15 \\ 16 \end{bmatrix} - 8.6667 \begin{bmatrix} 16 \\ 15 \end{bmatrix} = 10.8889 \\ & -1.1111 \begin{bmatrix} 15 \\ 16 \end{bmatrix} + 2.5442 \begin{bmatrix} 16 \\ 15 \end{bmatrix} = -0.32168 \\ & = 0.2 - 1.2109 \begin{bmatrix} 16 \\ 15 \end{bmatrix} = 11.2109 \end{aligned}$$

$$\begin{aligned} & \begin{bmatrix} 16 \\ 15 \end{bmatrix} = 11.2109 = -0.9997 \quad 2 \quad -1.0 \\ & -11.2109 \quad 9 \quad 0.022 \end{aligned}$$

$$\begin{bmatrix} 16 \\ 15 \end{bmatrix} = -1.0$$

$$T_6 = 15 \cdot 14$$

$$T_6 = 34 \cdot 0793$$

$$T_5 = 18 \cdot 142$$

$$T_6 = 23 \cdot 3193$$

$$0 = 32 \cdot 8594$$

$$= 34 \cdot 0793$$

$$2222$$

$$= -12 \cdot 4286$$

$$= 23 \cdot 3177$$

$$= -3111$$

$$1 \cdot 1111 T_5 = 8 \cdot 6667 (-1) = 10 \cdot 889$$

$$T_5 = 10 \cdot 889 - 8 \cdot 667$$

$$1 \cdot 1111$$

$$T_5 = 2$$

$$-3 \cdot 71429 T_4 + 0 \cdot 285714 (2) - 1 \cdot 85714 (-1) =$$

$$-12 \cdot 4286$$

$$T_4 = -12 \cdot 4286 - 0 \cdot 571428 - 1 \cdot 85714$$

$$-3 \cdot 71429$$

$$= 4$$

$$4 T_3 - 6 T_4 - 8 T_5 + 7 T_6 = -35$$

$$4 T_3 - 6(4) - 8(2) + 7(4) = -35$$

$$4 T_3 - 24 - 16 - 7 = -35$$

$$4 T_3 = -35 + 47 = 12$$

$$T_3 = 3$$

$$T_3 = 3$$

$$2 T_2 - 2 T_4 - T_5 + 2 T_6 = -19$$

$$2 T_2 - 2(4) - (2) + 2(-1) = -19$$

$$T_2 = \frac{-19 + 10}{2} = -4 = -2$$

$$T_2 = -2$$

$$T_1 + T_2 - 2 T_3 + T_4 + 3 T_5 - T_6 = 4$$

$$(T_1) + (-2) - 2(3) + (4) + 3(2) - (-1) = 4$$

$$T_1 - 2 - 6 + 4 + 6 + 1 = 4$$

$$T_1 = 4 - 3 = 1$$

$$T_1 = 1, T_2 = -2, T_3 = 3, T_4 = 4, T_5 = 2,$$

$$T_6 = -1$$