

Alamin Mohammed

15/Envt02/006

Computer Engineering

$$\begin{aligned}
 i) \quad & T_1 + T_2 - 2T_3 + T_4 + 3T_5 - T_6 = 4 \\
 & 2T_1 - T_2 + T_3 + 2T_4 + T_5 - 3T_6 = 20 \\
 & T_1 + 3T_2 - 3T_3 - T_4 + 2T_5 + T_6 = -15 \\
 & 5T_1 + 2T_2 - T_3 - T_4 + 2T_5 + T_6 = -3 \\
 & -3T_1 - T_2 + 2T_3 + 3T_4 + T_5 + 3T_6 = 16 \\
 & 4T_1 + 3T_2 + T_3 - 6T_4 + 3T_5 - 2T_6 = -27
 \end{aligned}$$

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 2 & -1 & 1 & 2 & 1 & -3 \\ 1 & 3 & -3 & -1 & 2 & 1 \\ 5 & 2 & -1 & -1 & 2 & 1 \\ -3 & -1 & 2 & 3 & 1 & 3 \\ 4 & 3 & 1 & -6 & 3 & -2 \end{bmatrix} \begin{bmatrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{bmatrix} = \begin{bmatrix} 4 \\ 20 \\ -15 \\ -3 \\ 16 \\ -27 \end{bmatrix}$$

$$\begin{aligned}
 & 1, 1, -2, 1, 3, -1 \mid 4 \\
 & 2 - \frac{2}{1}(1), -1 - \frac{1}{1}(1), 1 - \frac{2}{1}(2), 2 - \frac{2}{1}(1), 1 - \frac{2}{1}(3), -1 - \frac{2}{1}(4) \mid 20 - \frac{2}{1}(4) \\
 & 1 - \frac{1}{1}(1), 3 - \frac{1}{1}(1), -3 - \frac{1}{1}(2), -1 - \frac{1}{1}(1), 2 - \frac{1}{1}(3), -3 - \frac{1}{1}(4) \mid -15 - \frac{1}{1}(4) \\
 & 5 - \frac{5}{1}(1), 2 - \frac{5}{1}(1), -1 - \frac{5}{1}(2), -1 - \frac{5}{1}(1), 2 - \frac{5}{1}(3), 1 - \frac{5}{1}(4) \mid -3 - \frac{5}{1}(4) \\
 & -3 - \frac{(-3)}{1}(1), -1 - \frac{(-3)}{1}(1), 2 - \frac{(-3)}{1}(2), 3 - \frac{(-3)}{1}(1), 1 - \frac{(-3)}{1}(3), 3 - \frac{(-3)}{1}(4) \mid 16 - \frac{(-3)}{1}(4) \\
 & 4 - \frac{4}{1}(1), 3 - \frac{4}{1}(1), 1 - \frac{4}{1}(2), -6 - \frac{4}{1}(1), -3 - \frac{4}{1}(3), -2 - \frac{4}{1}(4) \mid -27 - \frac{4}{1}(4)
 \end{aligned}$$

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 & 4 \\ -1 & 1 & -2 & 1 & 3 & -1 & 12 \\ 0 & -3 & 5 & 0 & -5 & -1 & 19 \\ 0 & 2 & -1 & -2 & -1 & 2 & -23 \\ 0 & -3 & 9 & -6 & -13 & 6 & 28 \\ 0 & 2 & -4 & 6 & 10 & 0 & 43 \\ 0 & -1 & 9 & -10 & -15 & 2 & 43 \end{bmatrix}$$

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 & 4 \\ 0 & -3 & 5 & 0 & -5 & -1 & 12 \\ 0 & 2 - \frac{2(-3)}{-3} & -1 - \frac{2(5)}{-3} & -2 - \frac{2(6)}{3} & -1 - \frac{2(-5)}{3} & 2 - \frac{2(-1)}{3} & -19 - \frac{2(12)}{3} \\ 0 & -3 - \frac{(-3)(-3)}{-3} & 9 - \frac{(-3)(5)}{-3} & -6 - \frac{2(6)}{3} & -13 - \frac{2(-5)}{3} & 6 - \frac{2(-1)}{3} & -23 - \frac{2(12)}{3} \\ 0 & 2 - \frac{2(-3)}{-3} & -4 - \frac{2(5)}{-3} & 6 - \frac{2(6)}{3} & 10 - \frac{2(-5)}{3} & 0 - \frac{2(-1)}{3} & 28 - \frac{2(12)}{3} \\ 0 & -1 - \frac{2(-1)(-3)}{-3} & 9 - \frac{(-1)(5)}{-3} & -10 - \frac{2(6)}{3} & -15 - \frac{2(-5)}{3} & 2 - \frac{2(-1)}{3} & -43 - \frac{2(12)}{3} \end{bmatrix}$$

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 & 4 \\ 0 & -3 & 5 & 0 & -5 & -1 & 12 \\ 0 & 0 & 2.333 & -2 & -4.333 & 1.333 & -11 \\ 0 & 0 & 4 & -6 & -8 & 7 & -35 \\ 0 & 0 & -0.667 & 6 & 6.667 & -0.667 & 36 \\ 0 & 0 & 7.333 & -10 & -13.333 & 2.333 & -47 \end{bmatrix}$$

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 & 4 \\ 0 & -3 & 5 & 0 & -5 & -1 & 12 \\ 0 & 0 & 2.333 & -2 & -4.333 & 1.333 & -11 \\ 0 & 0 & 4 - \frac{4(2.333)}{2.333} & -6 - \frac{4(-2)}{2.333} & -8 - \frac{4(-4.333)}{2.333} & 7 - \frac{4(1.333)}{2.333} & -35 - \frac{4(-11)}{2.333} \\ 0 & 0 & -0.667 - \frac{(-0.667)(2.333)}{2.333} & 6 - \frac{(-0.667)(-2)}{2.333} & 6 - \frac{(-0.667)(-4.333)}{2.333} & -0.667 - \frac{(-0.667)(1.333)}{2.333} & 36 - \frac{(-0.667)(-11)}{2.333} \\ 0 & 0 & 7.333 - \frac{7.333(2.333)}{2.333} & -10 - \frac{7.333(-2)}{2.333} & -13.333 - \frac{7.333(-4.333)}{2.333} & 2.333 - \frac{7.333(1.333)}{2.333} & -47 - \frac{7.333(-11)}{2.333} \end{bmatrix}$$

$$\begin{bmatrix} 4 \\ 12 \\ -11 \\ -35 - \frac{4(-11)}{2.333} \\ 36 - \frac{(-0.667)(-11)}{2.333} \\ -47 - \frac{(7.333)(-11)}{2.333} \end{bmatrix} = \begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 & 4 \\ 0 & -3 & 5 & 0 & -5 & -1 & 12 \\ 0 & 0 & 2.333 & -2 & -4.333 & 1.333 & -11 \\ 0 & 0 & 0 & -2.571 & -6.571 & 4.714 & -16.142 \\ 0 & 0 & 0 & 5.428 & 5.428 & -0.285 & 32.857 \\ 0 & 0 & 0 & -3.714 & 0.285 & -1.857 & -12.428 \end{bmatrix}$$

$$\begin{bmatrix}
 1 & 1 & -2 & 1 & 3 & -1 \\
 0 & -3 & 5 & 0 & -5 & -1 \\
 0 & 0 & 2.333 & -2 & -4.333 & 1.333 \\
 0 & 0 & 0 & -2.571 & -0.571 & 4.714 \\
 0 & 0 & 0 & 5.428 - 5.428(2.571) & 5.428 - 5.428(-0.571) & -0.285 - 5.428(4.714) \\
 0 & 0 & 0 & -3.714 - \frac{(-3.714)(-2.571)}{-2.571} & 0.285 - \frac{(-3.714)(-0.571)}{-2.571} & -1.857 - \frac{(-3.714)(4.714)}{-2.571}
 \end{bmatrix}$$

$$\begin{bmatrix}
 4 \\
 -12 \\
 -11 \\
 -16.142 \\
 32.857 - \frac{5.428(-16.142)}{-2.571} \\
 -12.428 - \frac{(-3.714)(4.714)}{-2.571}
 \end{bmatrix}$$

$$= \begin{bmatrix}
 1 & 1 & -2 & 1 & 3 & -1 & 4 \\
 0 & -3 & 5 & 0 & -5 & -1 & 12 \\
 0 & 0 & 2.333 & -2 & -4.333 & 1.333 & -11 \\
 0 & 0 & 0 & -2.571 & -0.571 & 4.714 & -16.142 \\
 0 & 0 & 0 & 0 & 4.222 & 9.667 & -1.222 \\
 0 & 0 & 0 & 0 & 1.111 & -8.667 & 10.889
 \end{bmatrix}$$

$$\begin{bmatrix}
 1 & 1 & -2 & 1 & 3 & -1 & 4 \\
 0 & -3 & 5 & 0 & -5 & -1 & 12 \\
 0 & 0 & 2.333 & -2 & -4.333 & 1.333 & -11 \\
 0 & 0 & 0 & -2.571 & -0.571 & 4.714 & -16.142 \\
 0 & 0 & 0 & 0 & 4.222 & 9.667 & -1.222 \\
 0 & 0 & 0 & 0 & 1.111 - \frac{1.111(4.222)}{4.222} & -8.667 - \frac{1.111(9.667)}{4.222} & 10.889 - \frac{1.111(-1.222)}{4.222}
 \end{bmatrix}$$

$$= \begin{bmatrix}
 1 & 1 & -1 & 3 & -1 \\
 0 & -3 & -2 & 0 & -5 \\
 0 & 0 & 5 & -2 & -5 \\
 0 & 0 & 2.333 & -2.571 & -4.333 & 1.333 \\
 0 & 0 & 0 & -2.571 & -0.571 & 4.714 \\
 0 & 0 & 0 & 0 & 4.222 & 9.667 \\
 0 & 0 & 0 & 0 & 0 & -11.21
 \end{bmatrix}
 \begin{bmatrix}
 T_1 \\
 T_2 \\
 T_3 \\
 T_4 \\
 T_5 \\
 T_6
 \end{bmatrix}
 = \begin{bmatrix}
 4 \\
 12 \\
 -11 \\
 -16.142 \\
 -1.222 \\
 11.210
 \end{bmatrix}$$

$$T_6 = \frac{11.210}{-11.210} = -1$$

$$T_5 = \frac{(1.222 - 9.667 \times T_6)}{4.222} = \frac{(1.222 - 9.667 \times -1)}{4.222}$$

$$= 2$$

$$T_4 = \frac{(-16.142 + 0.57143 \times T_5 + 4.714 \times T_6)}{-2.571} = \frac{-16.142 + 0.571 \times 2 + 4.714 \times -1}{-2.571}$$

$$= 4$$

$$T_3 = \frac{(-11 + 2 \times T_4 + 4.333 \times T_5 - 1.333 \times T_6)}{2.333} = \frac{-11 + 2 \times 4 + 4.333 \times 2 - 1.333 \times -1}{2.333}$$

$$= 3$$

$$T_2 = \frac{12 - 5 \times T_3 - 0 \times T_4 + 5 \times T_5 + 1 \times T_6}{-3} = \frac{12 - 5 \times 3 - 0 + 5 \times 2 + 1 \times -1}{-3}$$

$$= -2$$

$$T_1 = \frac{4 - 1 \times T_2 + 2 \times T_3 - 1 \times T_4 - 3 \times T_5 + 1 \times T_6}{1} = \frac{4 - 1 \times -2 + 2 \times 3 - 1 \times 4 - 3 \times 2 + 1 \times -1}{1}$$

$$= 1$$