

Alwabi/MSU Engrs & Chem
15/20/2016

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 & 4 \\ 0 & -3 & 5 & 0 & -5 & -1 & 12 \\ 0 & 2 & -1 & -2 & -1 & 2 & -19 \\ 0 & -3 & 9 & -6 & -13 & 6 & -23 \\ 0 & 2 & -4 & 6 & 10 & 0 & 28 \\ 0 & 1 & 9 & -10 & -14 & 2 & 43 \end{bmatrix}$$

$$a_{32} \text{ Row 3} - \frac{a_{11}}{a_{12}} \times \text{Row 2}$$

$$(i) \quad 2 - \frac{2}{-3}(-3) = 0 \quad (iv) \quad -1 - \left[\frac{2}{-3}\right](-5) = \frac{2}{3} \quad \text{Row 3:}$$

$$(ii) \quad -1 - \frac{2}{-3}(5) = \frac{7}{3} \quad (v) \quad 2 - \frac{2}{-3}(-1) = \frac{4}{3} \quad \left[0 \quad 0 \quad \frac{1}{3} \quad -2 \quad -\frac{3}{8} \quad \frac{4}{3} \quad -11 \right]$$

$$(iii) \quad -2 - \frac{2}{-3}(0) = -2 \quad (vi) \quad -1 - \frac{2}{-3}(12) = -11$$

$$a_{42} \text{ Row 4} - \left[\frac{3}{-3}\right] \times \text{Row 2}$$

$$(i) \quad -3 - 1(-3) = 0 \quad (vii) \quad -13 - 1(-15) = -8 \quad \left[0 \quad 0 \quad 4 \quad -6 \quad -8 \quad 7 \quad -35 \right]$$

$$(ii) \quad 9 - 1(5) = 4 \quad (viii) \quad 6 - 1(-1) = 7$$

$$(iii) \quad 8 - 1(0) = 8 \quad (ix) \quad -23 - 1(12) = -35$$

$$a_{62} \text{ Row 6} - \frac{1}{3} \text{ Row 2}$$

$$(i) \quad 1 - \frac{1}{3}(-3) = 2 \quad (x) \quad -15 - \frac{1}{3}(-5) = -\frac{40}{3}$$

$$(ii) \quad 9 - \frac{1}{3}(5) = \frac{22}{3} \quad (xi) \quad 2 - \frac{1}{3}(-1) = \frac{7}{3} \quad \left[0 \quad 0 \quad \frac{2}{3} \quad -10 \quad -\frac{40}{3} \quad \frac{7}{3} \quad 38 \right]$$

$$(iii) \quad -10 - \frac{1}{3}(0) = -10 \quad (xii) \quad 43 - \frac{1}{3}(12) = 39$$

$$\begin{bmatrix} 1 & 1 & 2 & 1 & 8 & -1 & 4 \\ 0 & -3 & 5 & 0 & 5 & -1 & 12 \\ 0 & 0 & \frac{7}{3} & -2 & -\frac{13}{3} & \frac{4}{3} & -11 \\ 0 & 0 & 4 & -6 & -8 & 7 & -35 \\ 0 & 0 & -\frac{2}{3} & 6 & \frac{20}{3} & -\frac{2}{3} & 36 \\ 0 & 0 & \frac{2}{3} & -10 & -\frac{40}{3} & \frac{7}{3} & 38 \end{bmatrix}$$

NWABINELI EMELO & CHISOMI

15/EN905/066

MECHATRONICS ENGINEERING

$$T_1 + T_2 + 2T_3 + T_4 - 5T_5 - T_6 = 4$$

$$2T_1 - T_2 + T_3 + 2T_4 + T_5 - 3T_6 = 20$$

$$T_1 + 3T_2 - 3T_3 + T_4 - 2T_5 + T_6 = -15$$

$$5T_1 + 2T_2 - T_3 - T_4 + 2T_5 + T_6 = -3$$

$$-5T_1 - T_2 - 2T_3 + 3T_4 + T_5 + 3T_6 = 16$$

$$4T_1 + 3T_2 + T_3 - 6T_4 - 3T_5 - 2T_6 = -27$$

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

$$(i) 2 - (2/1)(1) = 0$$

$$(iv) 2 - 2/1(1) = 0$$

$$(vii) 20 - 2/1(4) = 12$$

$$(ii) -1 - 2/1(1) = -3$$

$$(v) 1 - 2/1(3) = -5$$

$$(iii) 1 - 2/1(-2) = 5$$

$$(vi) -3 - 2/1(-1) = -1$$

$$\text{Row 2} = [0 \ -3 \ 5 \ 0 \ -5 \ -1 \ 12]$$

$$(i) 1 - 4/1(1) = 0$$

$$(iv) -1 - 1/1(1) = -2$$

$$(vii) 2 - 5 - 1(4) = -19$$

$$(ii) 3 - 1/1(1) = 2$$

$$(v) 2 - 1/1(3) = -1$$

$$(iii) -3 - 1/1(-2) = -1$$

$$(vi) 1 - 1/1(-1) = 2$$

$$\text{Row 3} = [0 \ 2 \ -1 \ -2 \ -1 \ 2 \ -19]$$

$$(i) 5 - 5/1(1) = 0$$

$$(iv) -1 - 5/1(1) = -6$$

$$(vii) 2 - 3 - 5(4) = 23$$

$$(ii) 2 - 5/1(1) = -3$$

$$(v) 2 - 5/1(3) = -13$$

$$(iii) 1 - 5/1(-2) = 9$$

$$(vi) 1 - 5/1(-1) = 6$$

$$\text{Row 4} = [0 \ -3 \ 9 \ -6 \ -13 \ 6 \ 23]$$

$$(i) 4 - 4/1(1) = 0$$

$$(iv) -6 - 4/1(1) = -10$$

$$(vii) 27 - 4(4) = 43$$

$$(ii) 3 - 4/1(1) = -1$$

$$(v) -3 - 4/1(3) = -15$$

$$(iii) 1 - 4/1(-2) = 9$$

$$(vi) -2 - 4/1(-1) = 2$$

$$\text{Row 6} = [0 \ -1 \ 9 \ -10 \ -15 \ 2 \ 43]$$