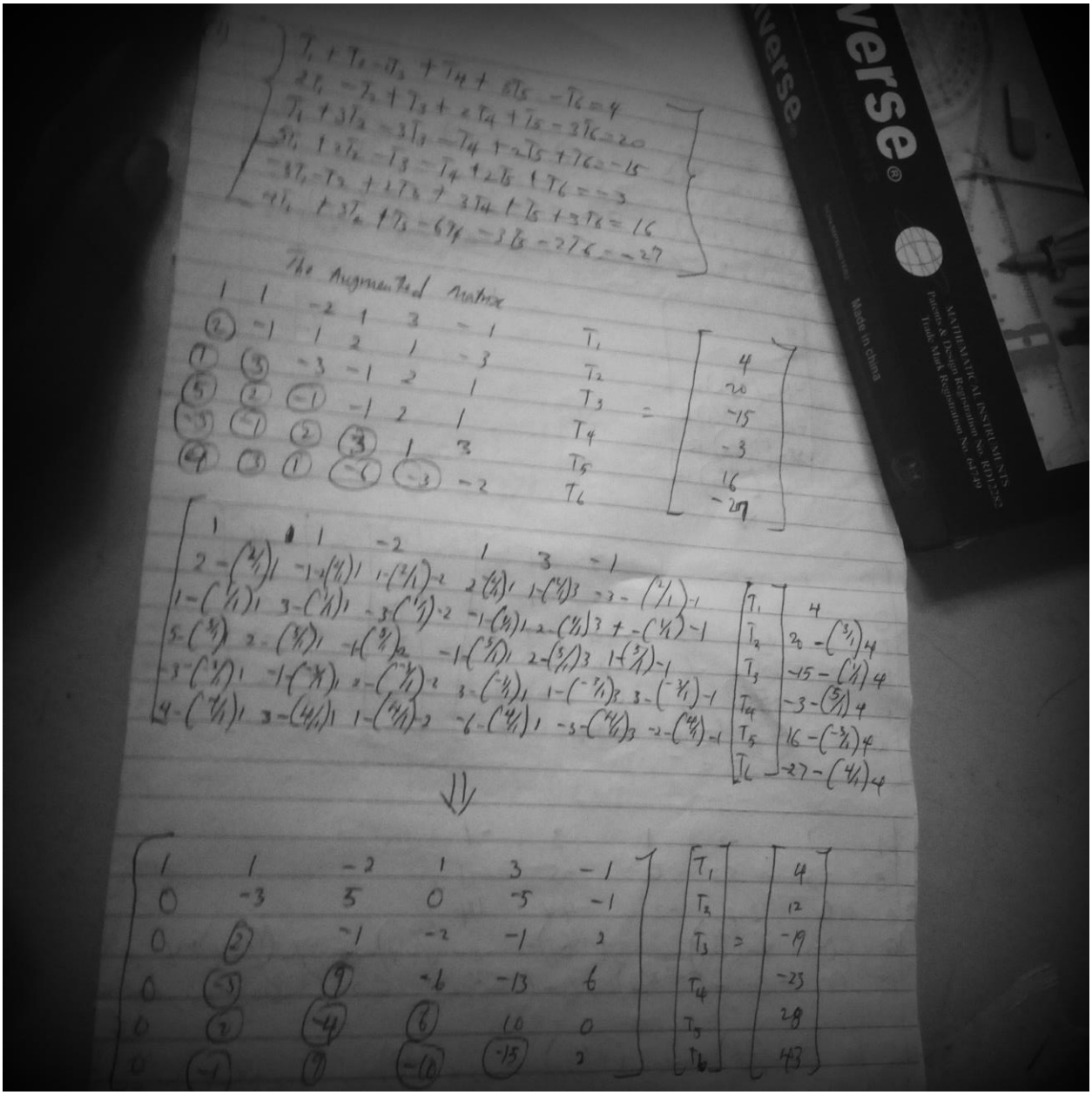
Falola Uthman Kayode

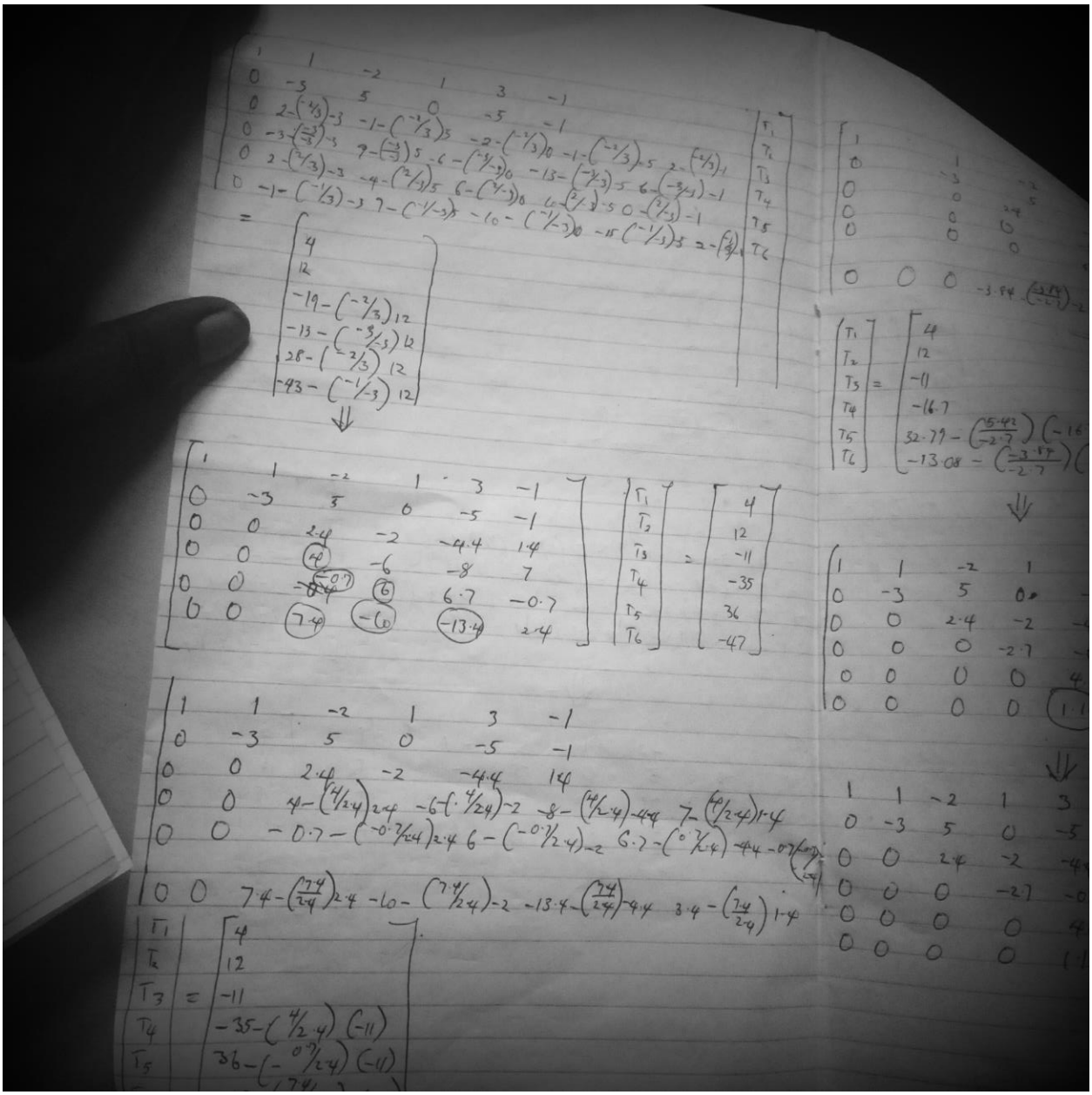
15/Eng02/024

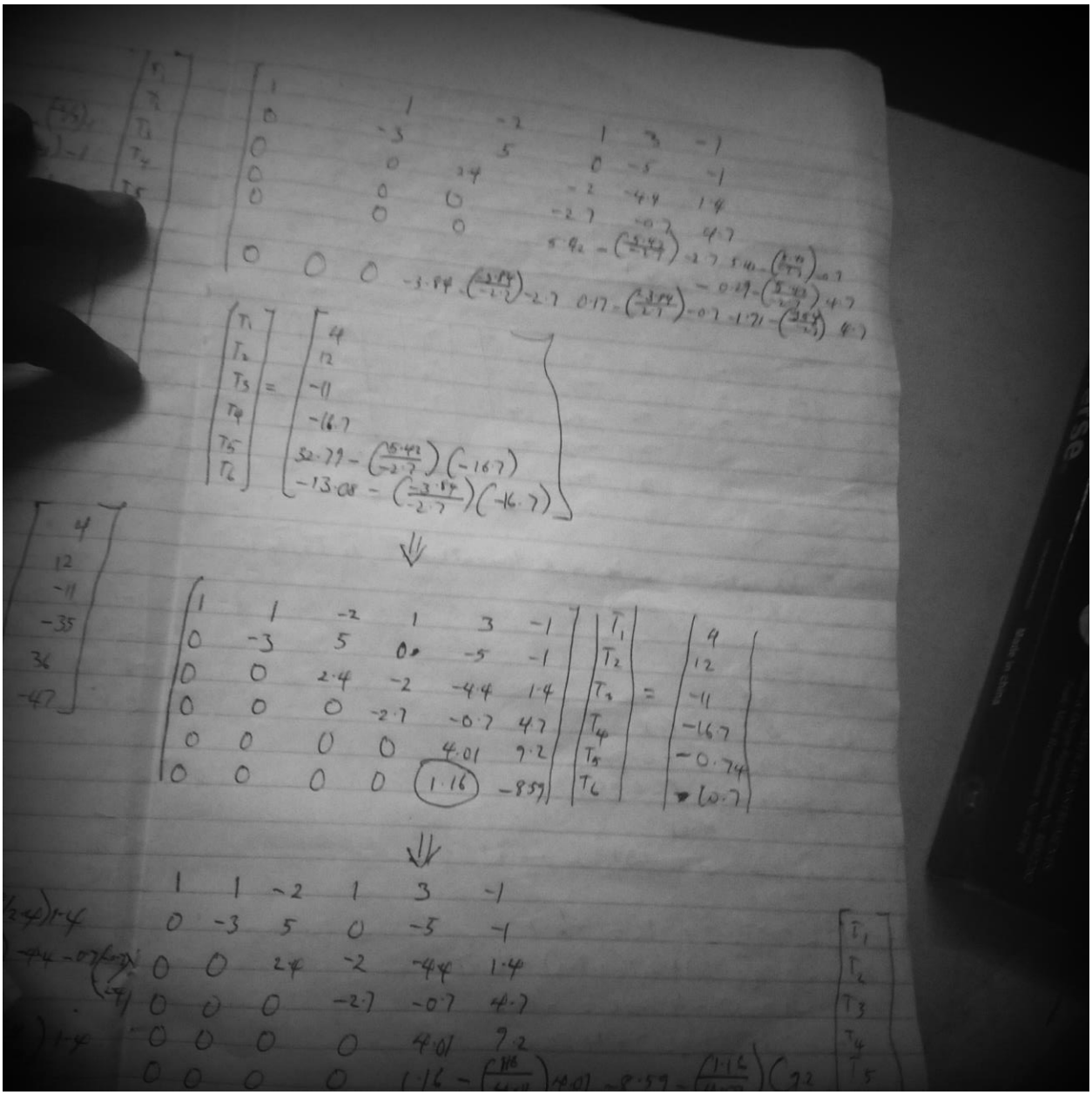
Computer Engineering

Maths Assignment 3

Assignment 3







$$= \begin{bmatrix} 4 \\ 12 \\ -11 \\ -16.7 \\ -0.74 \\ 10.7 - \left(\frac{1.14}{4.01}\right)(-0.74) \end{bmatrix}$$

The final matrix will be:

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 0 & -3 & 5 & 0 & -5 & -1 \\ 0 & 0 & 2.4 & -2 & -4.4 & 1.4 \\ 0 & 0 & 0 & -2.7 & -0.7 & 4.7 \\ 0 & 0 & 0 & 0 & 4.01 & 9.2 \\ 0 & 0 & 0 & 0 & 0 & -11.3 \end{bmatrix} \begin{bmatrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{bmatrix} = \begin{bmatrix} 4 \\ 12 \\ -11 \\ -16.7 \\ -0.74 \\ 10.72 \end{bmatrix}$$

From the above matrix we can solve for the temperatures T_1, T_2, T_3, T_4, T_5 & T_6 respectively.

$$-11.3\,T_6 = 10.92$$

$$T_6 = \frac{-10.72}{11.3}$$

$$T_6 = -0.768 \quad (1)$$

$$4.01\,T_5 + 9.2\,T_6 = -0.74$$

$$T_5 = \frac{-0.74 - 9.2(-0.968)}{4.01}$$

$$T_5 = \frac{8.143}{4.01} = 2.031 \quad (2)$$

$$-2.7\,T_4 - 0.7\,T_5 + 4.7\,T_6 = -16.7$$

$$-2.7\,T_4 - 0.7(2.031) + 4.7(-0.768) = -16.7$$

$$-2.7\,T_4 - 1.4217 - 4.5402 = -16.7$$

$$-2.7\,T_4 = -16.7 + 1.4217 + 4.5402$$

$$-2.7\,T_4 = -10.7381$$

$$T_4 = \frac{10.7381}{2.7} = 3.977 \quad (3)$$

$$2.4\,T_3 - 2\,T_4 - 4.4\,T_5 + 1.4\,T_6 = -11$$

$$T_3 = 2(3.977) - 4.4(2.031) + 1.4(-0.966) = -11$$

$$2.4T_3 = -11 + 18.2428$$

$$T_3 = \frac{7.2428}{2.4}$$

$$T_3 = 3.017 \quad \text{——— (4)}$$

$$-3T_2 + 5T_3 + 0T_4 - 5T_5 - 1T_6 = 12$$

$$-3T_2 + 5(3.017) + 0.5(2.031) - 1(-0.966) = 12$$

$$-3T_2 + 15.085 - 10.155 + 0.966 = 12$$

$$-3T_2 = 6.104$$

$$T_2 = -6.104/3$$

$$T_2 = -2.034 \quad \text{— (5)}$$

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

$$T_1 + (2.034) - 2(3.017) + 3.977 + 3(2.031) + 0.966 = 4$$

$$T_1 - 2.034 - 6.034 + 3.977 + 6.093 + 0.966 =$$

$$T_1 = 1.032 \quad \text{— (6)}$$

from eqn (1) – (6) eqn (6) respectively

$T_1 = 1.032^\circ C$

$T_2 = -2.034^\circ C$

$T_3 = 3.017^\circ C$

$T_4 = 3.977^\circ C$

$T_5 = 2.031^\circ C$

$T_6 = -0.966^\circ C$