

Scanned Documents

ASSIGNMENT 0
 MECHANICAL ENGR.
 DATE 15/11
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ASSIGNMENT III

If a model of a system having thermocouple measuring temps $T_1(t)$ at its different point is given by the set of express. in equations (a) estimate the values of the temperature using Gauss elimination method manually (with aid of a calculator) using elimination with the aid of microsoft excel where Gauss method with the aid of MATLAB

Solution

$$T_1 + T_2 - 3T_3 + T_4 + 5T_5 - T_6 = 4$$

$$2T_1 - T_2 + T_3 + 2T_4 + T_5 - 5T_6 = 20$$

$$T_1 + 5T_2 - 3T_3 - T_4 + 2T_5 + T_6 = -15$$

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

$$-5T_1 - T_2 + 2T_3 + 3T_4 + T_5 + 5T_6 = 14$$

$$4T_1 + 5T_2 + T_3 - 6T_4 - 5T_5 - 2T_6 = -27$$

$$A^{-1} \begin{pmatrix} 1 & 1 & -3 & 1 & 5 & -1 & 4 \\ 2 & -1 & 1 & 2 & 1 & -5 & 20 \\ 1 & 5 & -3 & -1 & 2 & 1 & -15 \\ 5 & 3 & -1 & -1 & 2 & 1 & -3 \\ -5 & -1 & 2 & 3 & 1 & 5 & 14 \\ 4 & 5 & 1 & -6 & -5 & -2 & -27 \end{pmatrix}$$

$$A^{-1} \begin{pmatrix} 1 & 1 & -3 \\ 2 & -1 & 1 \\ 1 & 5 & -3 \\ 5 & 3 & -1 \\ -5 & -1 & 2 \\ 4 & 5 & 1 \end{pmatrix} \begin{pmatrix} 4 \\ 20 \\ -15 \\ -3 \\ 14 \\ -27 \end{pmatrix}$$

Order through by t_1

$$A^{-1} \begin{pmatrix} 1 & 1 & -3 \\ 0 & 1 & 1 \\ 0 & 4 & 0 \\ 0 & -2 & 8 \\ 0 & -6 & 23 \\ 0 & -1 & 3 \end{pmatrix}$$

$$A^{-1} \begin{pmatrix} 1 & 1 & -3 \\ 0 & 1 & 1 \\ 0 & 0 & 1 \\ 0 & 0 & 1 \\ 0 & 0 & 1 \\ 0 & 0 & 1 \end{pmatrix}$$

Order through by t_2

$$A^{-1} \begin{pmatrix} 1 & 1 & -3 \\ 0 & 1 & 1 \\ 0 & 0 & 1 \\ 0 & 0 & 1 \\ 0 & 0 & 1 \\ 0 & 0 & 1 \end{pmatrix}$$