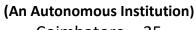


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DEPARTMENT OF MATHEMATICS

UNIT - III SOLUTIONS OF EQUATIONS

Gauss Elimination Method: (Solve the system of countions by Gaussian elimination method. 10 71 - 24+33 = 23 2 n + 10y - 53 = -33 371 - 49 +103 = 41 The given system is equivalent to AX=B $\begin{array}{c} (\dot{u}) \\ 2 \\ 3 \\ 3 \\ 3 \\ -4 \\ 10 \end{array} \right) \begin{pmatrix} \chi \\ 3 \\ -3 \\ 3 \\ 3 \\ -4 \\ 10 \end{array} \right) \begin{pmatrix} \chi \\ 3 \\ -3 \\ -33 \\ -41 \\ -33 \\ -33 \\ -41 \\ -33 \\ -33 \\ -41 \\ -33 \\ -33 \\ -41 \\ -33 \\ -41 \\ -33 \\ -41 \\ -33 \\ -41 \\ -33 \\$ Now $[A,B] = \begin{bmatrix} 10 - 2 & 3 & 23 \\ 2 & 10 - 5 & -33 \\ 3 - 4 & 10 & 41 \end{bmatrix}$ Let us reduce augmented matrin FA, BJ to upper triangular matrin.



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DEPARTMENT OF MATHEMATICS

UNIT - III SOLUTIONS OF EQUATIONS

Step 1: Fin the first row, change 2 & 3 row with row 1

$$\begin{bmatrix} A, B \end{bmatrix} \sim \begin{bmatrix} 10 & -2 & 3 & 23 \\ 0 & 10.4 & -5.6 & -37.6 \\ 0 & -3.4 & 9.1 & 34.1 \end{bmatrix} \begin{bmatrix} R_2 \leftrightarrow R_2 - \frac{2}{10} & R_1 \\ R_3 \leftrightarrow R_3 - \frac{3}{10} & R_1 \end{bmatrix}$$

$$\underbrace{Step 2: \quad \text{Hin 1& 2 row, change 3 row with 2^{nd} row} \\ \sim \begin{bmatrix} 10 & -2 & 3 & 23 \\ 0 & 10.4 & -5.6 & -37.6 \\ 0 & 0. & 7.26 & 21.80 \end{bmatrix} \begin{bmatrix} R_3 \leftrightarrow R_3 - (-3.4) \\ 10.4 \end{bmatrix} \begin{bmatrix} R_2 \\ R_3 \end{bmatrix} \begin{bmatrix} R_2 & R_3 \\ R_3 \end{bmatrix} \begin{bmatrix} R_2 \\ R_3 \end{bmatrix} \begin{bmatrix} R_2 \\ R_2 \\ R_2 \end{bmatrix} \\ ushelbh is an upper triangular matrin.$$

$$\underbrace{Step 3: Back substitution}_{10.4y=5:63} = 21.80 \implies 3 = 3 \\ 10.4y=5:63 = -37.6 \implies y = -2 \\ 10.7 - 2y + 33 = 23 \implies n = 1 \\ Hence & soln is & n = 1, y = -2, 3 = 3 \end{bmatrix}$$