Gauss Jordan Method :

This method is based on the idea of reducing the given system of equations $AX = b$, to a diagonal system of equations $IX = d$, where I is the identity matrix. $I = \begin{bmatrix} 1 & 0 & 0 \cdots \\ 0 & 1 & 0 \cdots \\ 0 & 0 & 0 \cdots 1 \end{bmatrix}$

by using elementary row operations. The solution of both the systems are identical. This reduced system gives the solution vector x.

ie $x = A^{-1}b$

$\therefore$ $[A|b] \longrightarrow [I|X]$

In this case, after the eliminations are completed, we obtain the augmented matrix for a 3×3 system as

$$\left[\begin{array}{ccc|c} 1 & 0 & 0 & d_1 \\ 0 & 1 & 0 & d_2 \\ 0 & 0 & 1 & d_3 \end{array}\right]$$

and the solution is $x_i = d_i$, $i = 1, 2, 3$.

Elimination Procedure :

(i) Firstly, elements below the first pivot as zeros, using elementary row transformations.

(ii) From, second step onwards, we make elements below and above the pivot as zeros using elementary row transformations.

(iii) Lastly, we divide each row by its pivot so that the final augmented

matrix comes to the form ①. Partial pivoting is usually used. We may also make the pivots as 1, before performing the elimination.