

EIGEN VALUES, EIGEN VECTORS:-

Let A be the square matrix of order $n \times n$, then a number (Real or complex) λ is said to be eigen value of matrix A if there exists a column matrix X of order $(n \times 1)$ such that

$$AX = \lambda X \longrightarrow \begin{array}{l} \text{Eigen vector of } A \\ \downarrow \\ \text{Eigenvalue of } A \end{array}$$

$$\begin{array}{l} AX - \lambda X = 0 \\ \boxed{(A - \lambda I)X = 0} \end{array}$$

\Rightarrow Working to find Eigen value and Eigen vector

Characteristics Equation of matrix A

$$\begin{array}{ccc} |A - \lambda I| = 0 & \text{Characteristics Equation} \\ \downarrow & \downarrow \\ & \text{Square Matrix} \end{array}$$

Solution of characteristics

equation is called Eigenvalues.