## 5.3 Matrices

**525.** Definition
An $m \times n$ matrix A is a rectangular array of elements (numbers or functions) with m rows and n columns.

$$A = [a_{ij}] = \begin{bmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \vdots & \vdots & & \vdots \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{bmatrix}$$

**526.** Square matrix is a matrix of order $n \times n$.

**527.** A square matrix $[a_{ij}]$ is symmetric if $a_{ij} = a_{ji}$, i.e. it is symmetric about the leading diagonal.

**528.** A square matrix $[a_{ij}]$ is skew-symmetric if $a_{ij} = -a_{ji}$.

**529.** Diagonal matrix is a square matrix with all elements zero except those on the leading diagonal.

**530.** Unit matrix is a diagonal matrix in which the elements on the leading diagonal are all unity. The unit matrix is denoted by I.

**531.** A null matrix is one whose elements are all zero.