Algebra of Matrices Ex 5.1 Q16

$$\begin{bmatrix} xy & 4 \\ z+6 & x+y \end{bmatrix} = \begin{bmatrix} 8 & w \\ 0 & 6 \end{bmatrix}$$

The corresponding entries of the two equal matrices are equal.

$\Rightarrow$ xy = 8 ......(1),

w = 4 ....(2),

z + 6 = 0 ....(3),

and x + y = 6 ....(4)

from equation (2) and equation(3) we get z = - 6 and w = 4.

from equation(4) we have,

x + y = 6,

$\Rightarrow$ x = 6 - y,

subsituting value of x in equation (1) we get,

$\Rightarrow$ (6 - y)y = 8,

$\Rightarrow$ y^2- 6y + 8 = 0,

$\Rightarrow$ (y - 2) (y - 4)= 0,

$\Rightarrow$ y = 2, 4

subsituting the value of y in equation(1) we get ,

$\Rightarrow$ x = 4, 2

Therefore, value of x , y , z ,w are 2 , 4 , - 6, 4 or 4, 2 , -6 , 4 .

Algebra of Matrices Ex 5.1 Q17

(i) We know that,

Order of a row matrix $= 1 \times n$

order of a column matrix $= m \times 1$

So, order of a row as well as column matrix = 1×1

Therefore,

Required matrix = $[a]_{1\times 1}$

(ii) A diagonal matrix has only $a_{11},\ a_{22},\ a_{33}$ for a 3×3 matrix such that $a_{11},\ a_{22},\ a_{33}$ are equal or different and all other entries zero while scalor matrix has $a_{11} = a_{22} = a_{33} = m$ (say) So, A diagonal matrix which is not scalar must have, $a_{11} \neq a_{22} \neq a_{33}$ and $aij = 0$ for $i \neq j$, So

$$\text{Required Matrix} = \begin{bmatrix} 4 & 0 & 0 \\ 0 & -3 & 0 \\ 0 & 0 & 2 \end{bmatrix}$$

(iii) A triangular matrix is a square matrix $A = [aij]$ such that $aij = 0$ for all $i > j$, so

$$A = \begin{bmatrix} 3 & 2 & -1 \\ 0 & 4 & 3 \\ 0 & 0 & -6 \end{bmatrix}$$

Algebra of Matrices Ex 5.1 Q18

Given data is,

For January 2013:

	Deluxe	Premium	Standard Cars
Dealer A	5	3	4
Dealer B	7	2	3

For January-February :

	Deluxe	Premium	Standard Cars
Dealer A	8	7	6
Dealer B	10	5	7

Hence,

$$A = \begin{array}{c} \\ \text{Dealer A} \\ \text{Dealer B} \end{array} \begin{array}{c} \begin{array}{ccc} \text{Deluxe} & \text{Premum} & \text{Standard} \end{array} \\ \begin{bmatrix} 5 & 3 & 4 \\ 7 & 2 & 3 \end{bmatrix} \end{array}$$

$$B = \begin{array}{c} \\ \text{Dealer A} \\ \text{Dealer B} \end{array} \begin{array}{c} \begin{array}{ccc} Deluxe & \text{Pr}\,emum & \text{Standard} \end{array} \\ \begin{bmatrix} 8 & 7 & 6 \\ 10 & 5 & 7 \end{bmatrix} \end{array}$$

*********** END **********