Unit-2

→ Matrices and Determinates.

ex-1 specify the type of each of the following matrices.

(i) $\begin{bmatrix} \sqrt{5} & 0 & 0 \\ 0 & -\frac{1}{3} & 0 \\ 0 & 0 & \frac{4}{5} \end{bmatrix}$ 3×3

→ It is the Diagonal Matrix because because all the numbers jeky hina jai diagonal mai present ahi-us ka upar aur neechy saray numbers Zero hon. Aur number diagonal mai alag alag hijo khepin.

ex. $\begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$

This is Null Matrix because every row and column is Zero

(ii) $\begin{bmatrix} \sqrt{3} \\ 4 \\ 7 \end{bmatrix}$ 3 row 1 column

→ so asan hika colum wari matrix khai asan column matrix chawanda Ayu.

→ Column Matrix

but agr $\begin{bmatrix} \sqrt{3} & 4 & 7 \end{bmatrix}$

This is the row Matrix.

(iii) $\begin{bmatrix} \frac{i}{2} & 0 & \frac{i}{2} \end{bmatrix}$

row matrix.

iv) $\begin{bmatrix} 0 & i \\ i & 0 \end{bmatrix}$ → A → skew Hermitian matrix

(jadhi asan $(\bar{A})^t = -A$

→ conjucate. Mean to chang the sign of ~~imaginary~~ Img → numbers.

sol

$\bar{A} = \begin{bmatrix} 0 & -i \\ -i & 0 \end{bmatrix}$ now transpose. Make row as as column and column as a row

$(\bar{A})^t = \begin{bmatrix} 0 & -i \\ -i & 0 \end{bmatrix}$ now take Minus sign common.

$(\bar{A})^t = -\begin{bmatrix} 0 & i \\ i & 0 \end{bmatrix}$ so $(\bar{A})^t = -A$

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Subject Non Physics Paper Matrices Section Notes Date

Q2 ⇒ A news agent of a team records the number of papers sold on each day of one week as follows.

	Mon	Tue	Wed	Thr	Frid	Sat	Sun
Daily Down	80	90	100	95	85	75	70
Daily Jang	100	110	90	95	105	85	80

So

$$\begin{bmatrix} 80 & 90 & 100 & 95 & 85 & 75 & 70 \\ 100 & 110 & 90 & 95 & 105 & 85 & 80 \end{bmatrix}$$

2 rows
7 columns → Order

Q3, Find the values of the unknown in each of the following.

(i) $\begin{bmatrix} a & -4i \\ 8i & 6i \end{bmatrix} = \begin{bmatrix} 7i & b \\ c & d \end{bmatrix}$

$a = 7i$
$b = -4i$
$c = 8i$
$d = 6i$

→ This method is called comparing corresponding elements of equal matrices. or Matrix equality comparison.

ii) $\Rightarrow \begin{bmatrix} 2 & -3 & 5 \\ a & 9 & 0 \\ b & c & -1 \end{bmatrix} = \begin{bmatrix} d & e & g \\ -2 & f & 8 \\ -4 & 7 & -1 \end{bmatrix}$

Sol

$d = 2$ $g = 5$ $9 = f$ $c = 7$

$e = -3$ $a = -2$ $b = -4$

Q3/ Find the values of the unknown in each of the following.

iii).

$\begin{bmatrix} x+y & 0 & z \\ a & 2x+y & 6 \\ 9 & 1 & 3 \end{bmatrix} = \begin{bmatrix} 3 & 0 & 3x \\ 9 & 4 & 6 \\ \frac{a}{2} & 1 & 3 \end{bmatrix}$

$x+y = 3 \rightarrow$ (i)

$z = 3x \rightarrow$ (ii)

$2x+y = 4 \rightarrow$ (iii)

$a = \frac{y}{2} \rightarrow$ (iv)

$\rightarrow$ using Elimination Method.

$2\times$

~~$2x+y = 6$~~

~~$2x+y = 4$~~

$x+y = 3$

$2x+y = 4$

$- \quad - \quad -$

$x = 1$ ✓

Now put in eq i,

$1+y = 3$

$y = 2$ ✓

$z = 3(1)$

$z = 3$ ✓

$a = \frac{2}{2}$

$a = 1$ ✓

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Q4 Find the transpose of each of the following matrices.

(i) $\begin{bmatrix} -4 & 3 & 6 \end{bmatrix}$

Sol: It's row matrix

so it will convert into the column matrix.

$$\begin{bmatrix} -4 \\ 3 \\ 6 \end{bmatrix} = A^t$$

(ii) $\begin{bmatrix} 2i & 5i & -3i \\ 0 & -6i & 2i \end{bmatrix} = B$

$$B^t = \begin{bmatrix} 2i & 0 \\ 5i & -6i \\ -3i & 2i \end{bmatrix}$$

→ Part 2:-

Unit 2,

Matrices and and Determinants-

→ write down in tabular Qs 5 to 11

forms-

(i) $A = [a_{ij}]_{(2,3)}$

This is column represent by j

This one represent rows so row = 2. represent by i

Sol

$$\begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \end{bmatrix}$$

This is how we represent in Tabular form.

(ii) $X = [x_{ij}]_{(3,4)}$

3 rows

4 columns.

Sol

$$\begin{bmatrix} x_{11} & x_{12} & x_{13} & x_{14} \\ x_{21} & x_{22} & x_{23} & x_{24} \\ x_{31} & x_{32} & x_{33} & x_{34} \end{bmatrix}$$

Q6:-

→ Which of the following are symmetric or skew symmetric matrices?

(i)

$$A = \begin{bmatrix} 0 & -5 & -6 \\ 5 & 0 & 7 \\ 6 & -7 & 0 \end{bmatrix}$$

→ For symmetric matrix $A = A^t$

→ For skew symmetric matrix $A = -A^t$ or $-A = A^t$

sol

$$A^t = \begin{bmatrix} 0 & 5 & 6 \\ -5 & 0 & -7 \\ -6 & 7 & 0 \end{bmatrix}$$

$A \neq A^t$

or let's try $-A^t$ as a common.

$$A^t = -\begin{bmatrix} 0 & -5 & -6 \\ 5 & 0 & 7 \\ 6 & -7 & 0 \end{bmatrix}$$

so $A^t = -A$

so the given matrix is SkewSMatrix.

(ii) Dharsely.

(iii)

(iv)

(v)