MATRICES

SSR

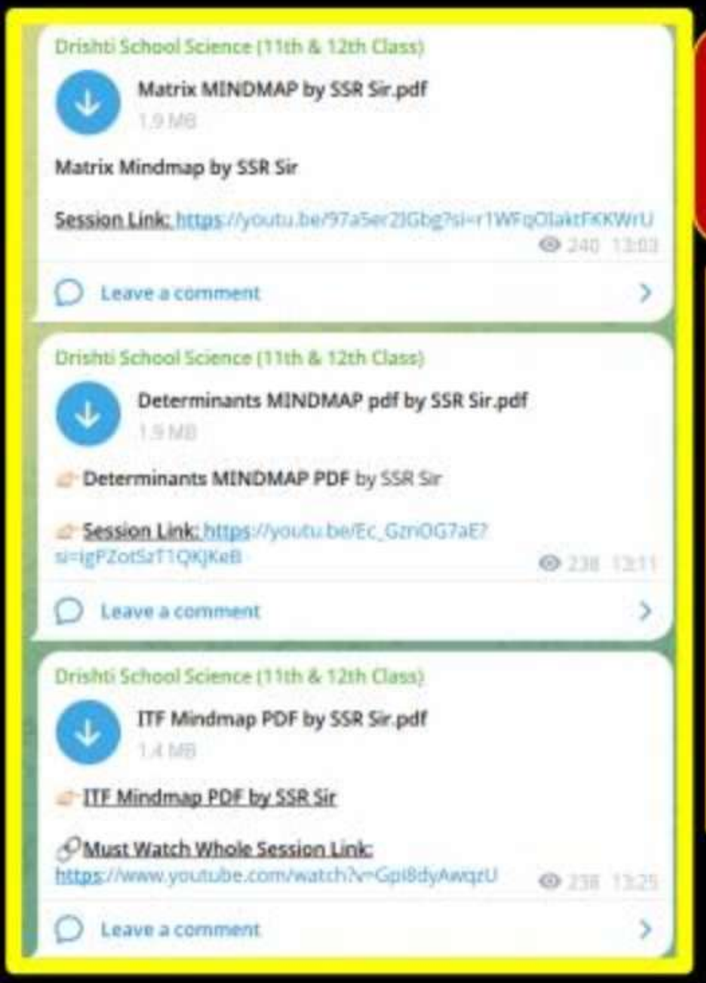
ONE SHOT

FULL CHAPTER

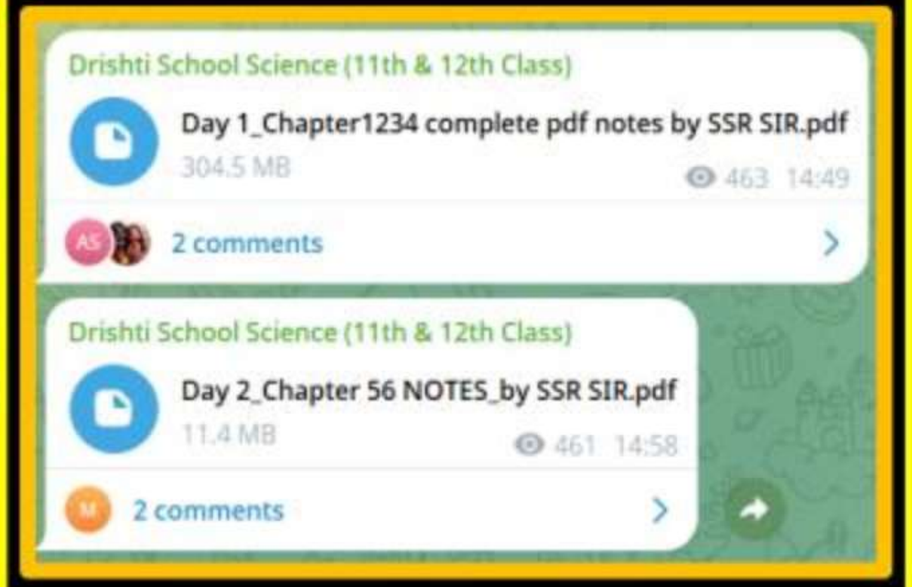
100% Yahi Se Paper Banega



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ABOUT This Chapter

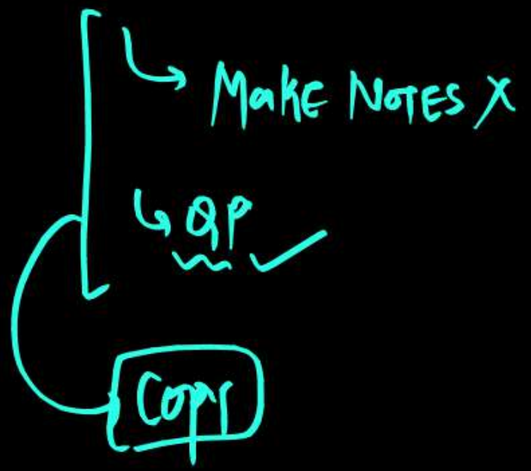
- **Weightage in CUET:** (M+D) ≡ (35-40) (7-8)Q.
- **Weightage in Class 12th** (10 Marks)

- **What resources you should follow:**
  - ↳ BPPT 6.0

- **Importance of Chapter**
  - ↳ ① Imp ② Easy ③ Pre-Connected

By- SSR Sir

Syllabus Covered

Chapter	Chapter Name	Syllabus	Deleted Syllabus
Chapter 3	Matrices	1. Matrix definitions 2. Types of Matrix 3. Properties of Matrix addition and multiplication 4. Transpose of a matrix 5. Properties of Transpose 6. Symmetric and skew symmetric matrix 7. Properties of symmetric and skew symmetric matrix	→ Elementary operations in Matrix → Technically nothing is deleted 

Topics *to be covered*



1. Matrix & Types of Matrices
2. Algebra of the matrices
3. Transpose of Matrices & their properties
4. Symmetric and skew symmetric matrix



BASIC DEFINITION

A rectangular arrangement consisting some number of ROW's and Column's.

If a matrix having 'm' number of Rows and 'n' number of columns then

$$A \equiv (a_{ij})_{m\times n} \overset{def}{=} \begin{pmatrix} a_{11} & a_{12} & a_{13} & \cdots & a_{1n} \\ a_{21} & a_{22} & a_{23} & \cdots & a_{2n} \\ a_{31} & a_{32} & a_{33} & \cdots & a_{3n} \\ \vdots & \vdots & \vdots & \ddots & \\ a_{m1} & a_{m2} & a_{m3} & & a_{mn} \end{pmatrix}_{m\times n}$$

C_1 C_2 C_3 C_n

R_1 R_2 R_3 R_m



Imp Terms – Samajh Lo

$m*n \equiv$ Order of The Matrix

m = No of Rows

n = No of Columns

a_{ij} = loc^n of an Element In the i^{th} Row & j^{th} Column.

$i = 1,2 \ldots m$

$j = 1,2,3 \ldots n$

Basic Types of Questions

(1) $A = [a_{ij}]_{2\times 3}$

$a_{ij} = i+j$

$a_{11} = 1+1 = 2$

$$A = \begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \end{bmatrix}_{2\times 3}$$

$$A = \begin{bmatrix} 2 & 3 & 4 \\ 3 & 4 & 5 \end{bmatrix}_{2\times 3}$$

(2)

Total No of Element $= 6 = 2\times 3$

Question: CUET 2026 PYQs

The number of all possible matrices of order 3×3 with each entry $-1, 0$ or 1 is

1. 9^6
2. 9^3
3. 3^9
4. 2^7

Question – CUET 2025 PYQs

If $a_{ij} = i + 3j$, then the matrix of order 2 with elements as a_{ij} is

A $\begin{bmatrix} 4 & 7 \\ 5 & 12 \end{bmatrix}$

B $\begin{bmatrix} 3 & 7 \\ 5 & 12 \end{bmatrix}$

C $\begin{bmatrix} 4 & 7 \\ 5 & 8 \end{bmatrix}$

D $\begin{bmatrix} 3 & 7 \\ 5 & 14 \end{bmatrix}$

$$A = \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix}_{2\times 2} = \begin{bmatrix} 4 & 7 \\ 5 & 8 \end{bmatrix}$$

$a_{ij} = i + 3j$

$a_{11} = 1 + 3(1) = 4$

$a_{12} = 1 + 3(2) = 7$

$a_{21} = 2 + 3 = 5$

$a_{22} = 2 + 3(2) = 8$

Question – CUET 2025 PYQs

Let the matrix $A = [a_{ij}]_{3\times3}$ be defined by $a_{ij} = \begin{cases} 2i+3j, & i<j \\ 5, & i=j \\ 3i-2j, & i>j \end{cases}$

The number of elements in the matrix A which are greater than 7, is:

A. 2

B. 3

C. 4

D. 5

$a_{ij} = 3i-2j$

$A = \begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix}_{3\times3} = \begin{bmatrix} 5 & 8 & 11 \\ 4 & 5 & 13 \\ 7 & 5 & 5 \end{bmatrix}$

$a_{21} = 3(2)-2(1)$

$\Rightarrow 6-2 = 4$

$a_{31} = 3(3)-2(1)$

$\Rightarrow 9-2 \Rightarrow 7$

$a_{32} = 3(3)-2(2) \Rightarrow 5$

$a_{12} = 2(1)+3(2) = 8$

$a_{13} = 2(1)+3(3) = 11$

$a_{23} = 2(2)+3(3) = 13$

Question – CBSE 2024 PYQs

If A= $[a_ij]$ be a 3×3 matrix, where a_{ij} =i-3j, then which= is false ?

A $a_{11} < 0$

B $a_{12} + a_{21} = -6$

C $a_{13} > a_{31}$

D $a_{31} = 0$

Question – CBSE 2025 PYQs [MCQS]

Let $A = [a_{ij}]$ be a square matrix of order 3 such that $a_{ij} = \hat{j} - 2\hat{i}$. Then which of the following is true?

A $a_{12} > 0$

B all $a_{ij} < 0$

C $a_{13} + a_{31} = -6$

D $a_{23} > a_{32}$

Question – CBSE 2024 PYQs

If A= $[a_ij]$ be a 3×3 matrix, where a_{ij} =i-3j, then which= is false ?

A $a_{11} < 0$

B $a_{12} + a_{21} = -6$

C $a_{13} > a_{31}$

D $a_{31} = 0$

IMP NOTE 1

If a matrix having 'm' number of rows & 'n' number of columns, then total no of elements in the matrix will be $= m \cdot n$

Total No of Element = 12

$N \equiv 1, 2, 3, 4, 5 \ldots$

Possible Order ?

$\begin{bmatrix} m \in N \\ m \in N \end{bmatrix}$

	m*n	
12	1*12	12*1
	2*6	6*2
	3*4	4*3
	6*1	1*6

8 Possible Matrices

IMP NOTE 2

If a matrix having ‘mn’ number of elements then what is the possible order

Question – CUET 2025 PYQs

If a matrix has 8 elements then the possible order(s) it may have

(A) 8×1

(B) 5×3

(C) 6×2

(D) 2×4

Choose the correct answer from the options given below:

A (A) and (D) only

B (B) and (C) only

C (A) Only

D (A), (B), (C) and (D)

Question – CUET 2025 PYQs

If a matrix has 12 elements, then the possible orders it can have, are

A. 1×12

B. 4×3

C. 6×3

D. 6×2

A, B, D

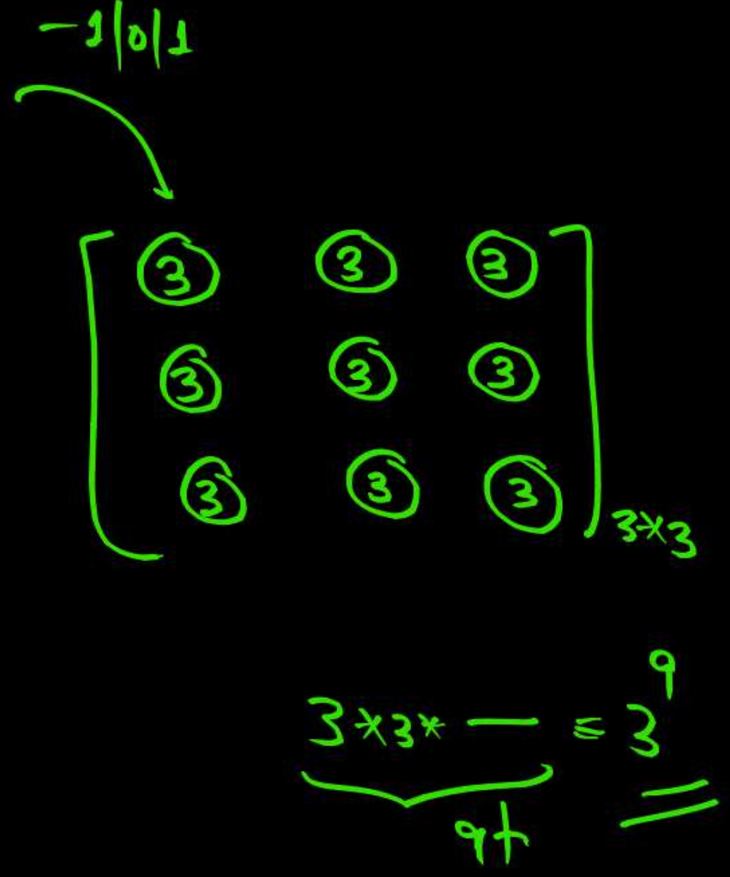
IMP NOTE 3

If matrix having order mn, each entries filled by.....

Question: CUET 2026 PYQs

The number of all possible matrices of order 3×3 with each entry $-1, 0$ or 1 is

1. 9^6
2. 9^3
3. 3^9
4. 2^7



$3 * 3 * \underbrace{-}_{9\text{ th}} = 3^9$

Question – CUET 2025 PYQs

Let $A = [a_{ij}]$ be a square matrix of order 3 with each entry either 0 or 1, then the number of all such possible matrices is:

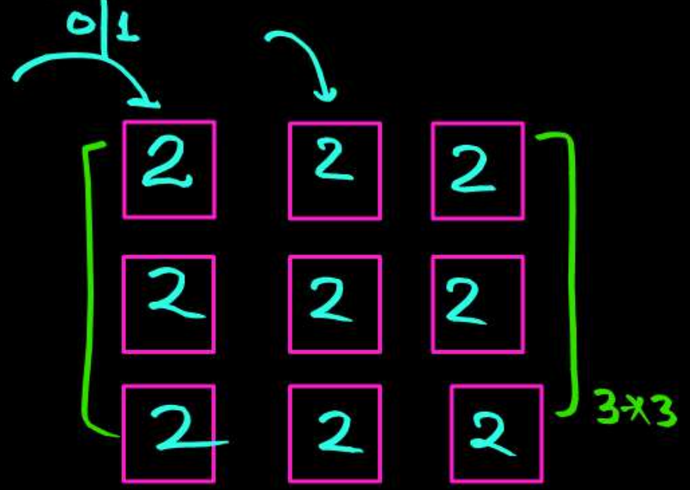


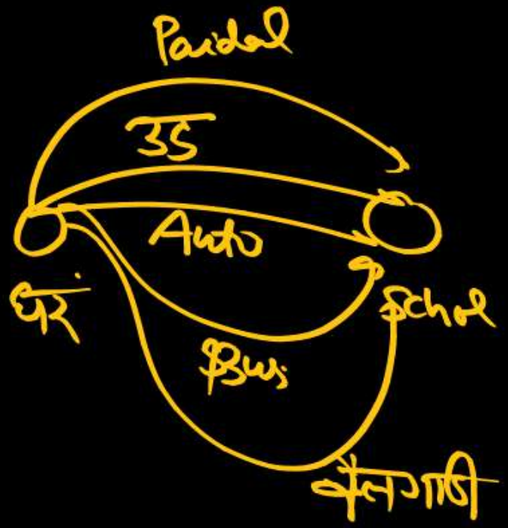
256

81

243

512





Total possible Matrices ⇒ $\underbrace{2*2*2*\cdots}_{9\text{ times}} \Rightarrow 2^9 \Rightarrow 512$

Question – CUET 2025 PYQs

The number of all possible matrices of order 2×3 with each entry 0 or 1 is

A 8

B 16

C 32

D 64 ✓

2^6

Question – CUET 2025 PYQs

The number of all possible matrices of order 2 × 3 with entries -1 or 1 is

A 64

B 6

C 32

D 16

2^6

What is the total number of possible matrices of order 3×3 with each entry as $\sqrt{2}$ or $\sqrt{3}$?



A 9

B 512

C 615

D 64

Question – CUET 2025 PYQs

Match List-I with List-II

List-I	List-II
(A) The number of possible matrices of order 3×3 with each entry 1 or 0	(I) 2^4
(B) The number of possible matrices of order 2×3 with each entry 1 or 0	(II) 2^9
(C) The number of possible matrices of order 2×3 with each entry $0, 1, 2$	(III) 2^6
(D) The number of possible matrices of order 2×2 with each entry 1 or 0	(IV) 3^6

Question – CUET 2025 PYQs

Choose the correct answer from the options given below:

A (A) - (II), (B) - (III), (C) - (IV), (D) - (I)

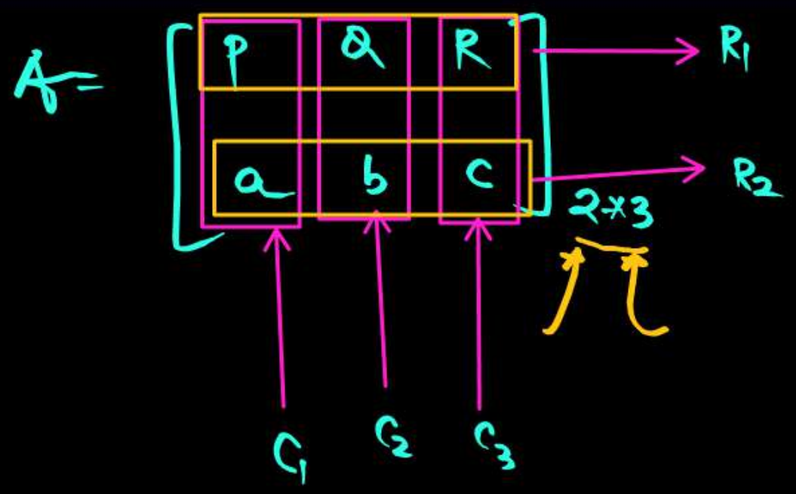
B (A) - (III), (B) - (I), (C) - (IV), (D) - (II)

C (A) - (IV), (B) - (I), (C) - (II), (D) - (III)

D (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

IMP NOTE 4

If a matrix having m rows and n columns then
Number of elements in each row: n
Number of elements in each column: m





No of Element Consists Each Column ≡ 2

No of Element Consist Each Row ≡ 3

Question – CUET 2025 PYQs

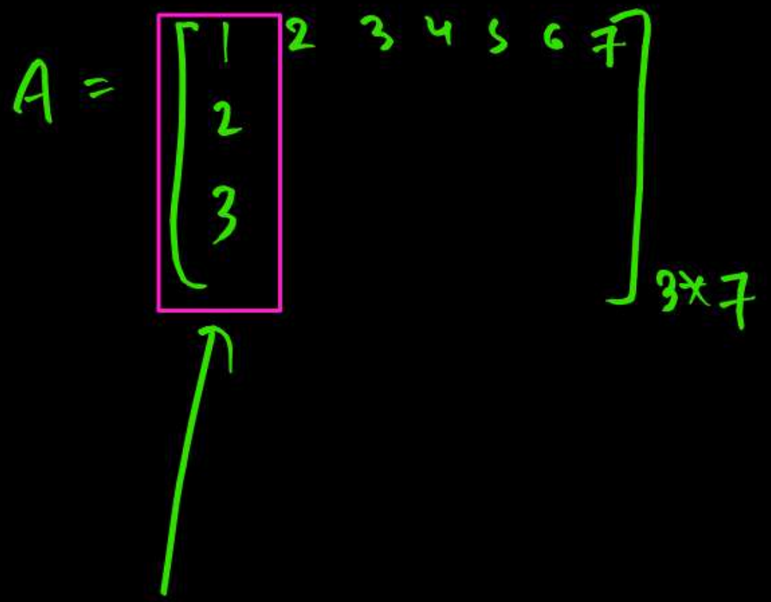
Let A be a 3×7 matrix, then each column of A contains:

A. 7 elements

B. 3 elements

C. 21 elements

D. 10 elements



Types of Matrix

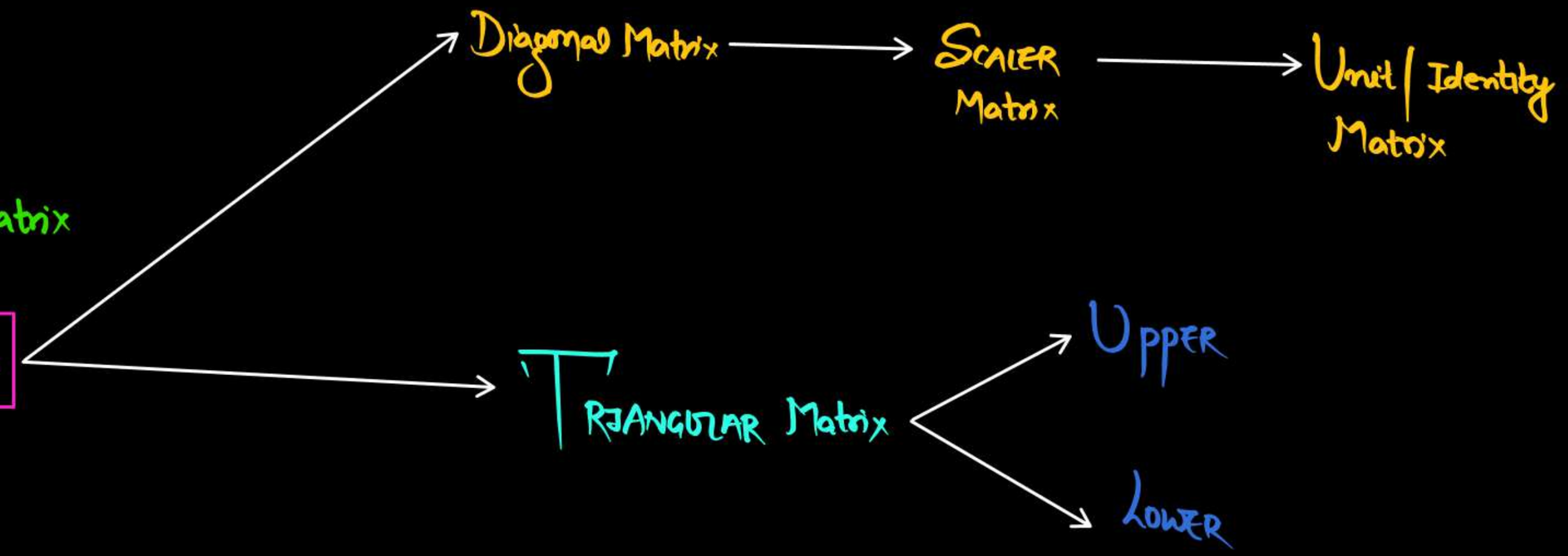
(I) Row Matrix

(II) Column Matrix

(III) Rectangular Matrix

(IV) Square Matrix

(V) Null Matrix





Type of MATRIX

1 ROW MATRIX

→ A Matrix having only 1 Row.

$$A = \begin{bmatrix} a & b & c & d \end{bmatrix}_{1*4}$$

$$A = [a_{ij}]_{1*n}$$

2 COLUMN MATRIX

→ A Matrix having only 1 Column.

$$A = \begin{bmatrix} a \\ b \\ c \\ d \end{bmatrix}_{4*1}$$

$$A = [a_{ij}]_{m*1}$$

3

RECTANGULAR MATRIX

→ A Matrix having

Number of Row's ≠ Column's

$m \neq n$

$$A = \begin{bmatrix} a & b & c \\ p & q & R \end{bmatrix}_{2\times 3}$$

$$A = [a_{ij}]_{m\times n} \quad (m \neq n)$$

4

SQUARE MATRIX



→ A Matrix having

$$\textbf{Number of Row's} = \textbf{Column's}$$
$$m = n$$

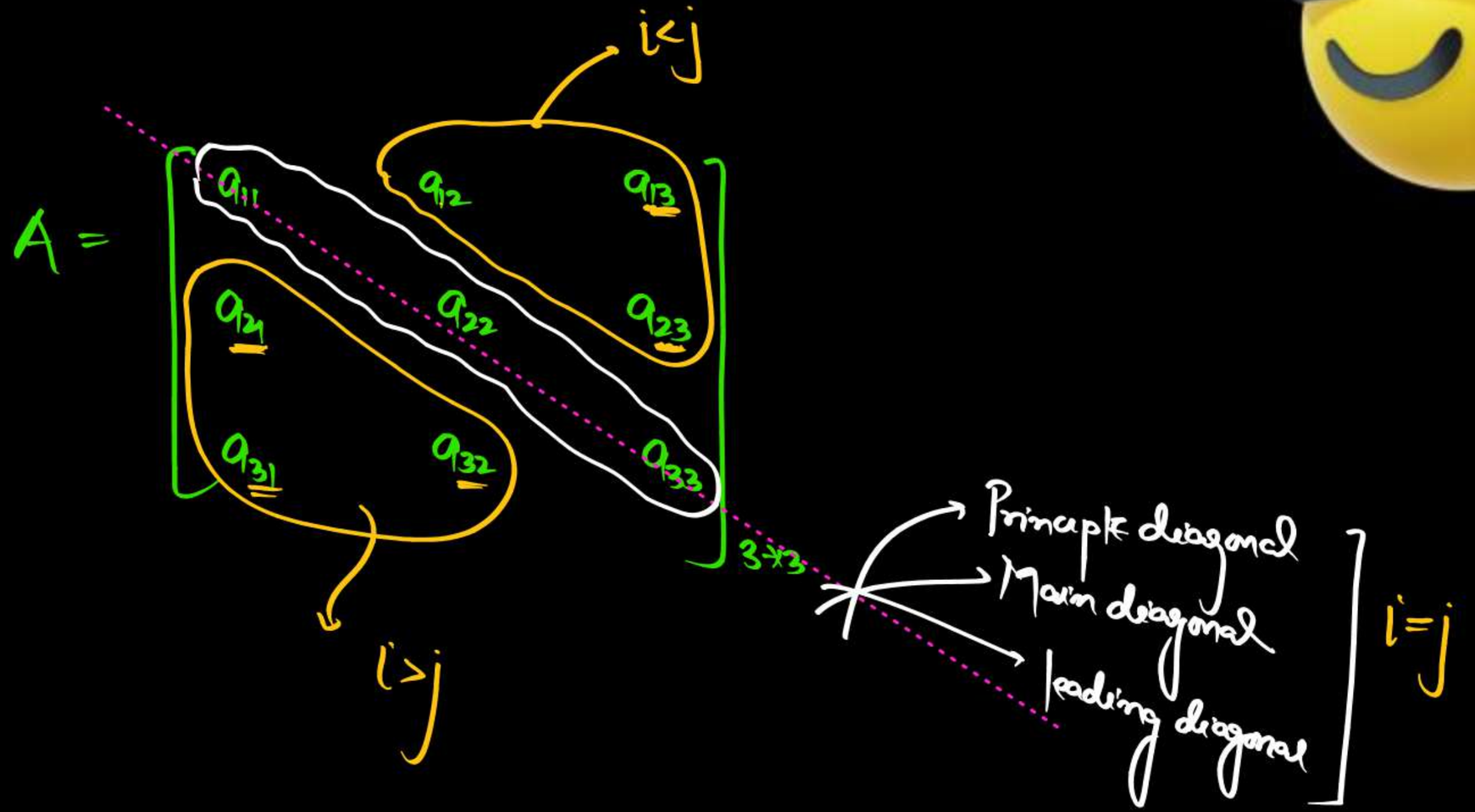
$$A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}_{2\times 2}$$

$$B = \begin{bmatrix} P & Q & R \\ 1 & 2 & 3 \\ a & b & c \end{bmatrix}_{3\times 3}$$

→ $A = [a_{ij}]_{m\times m}$ $(m = n)$

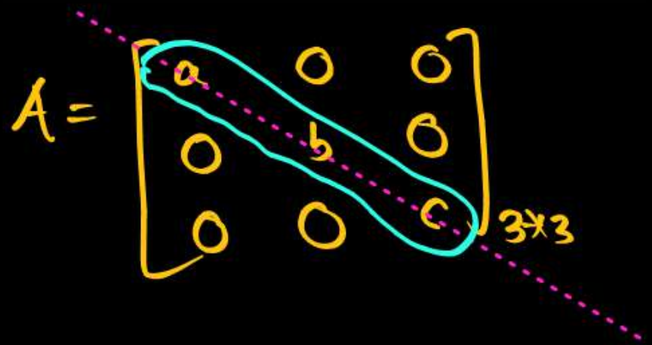
Square Matrix – IMP Points

3×3



5 DIAGONAL MATRIX

→ A ***Square matrix***, having elements at only at the diagonals, rest elements should be ZERO

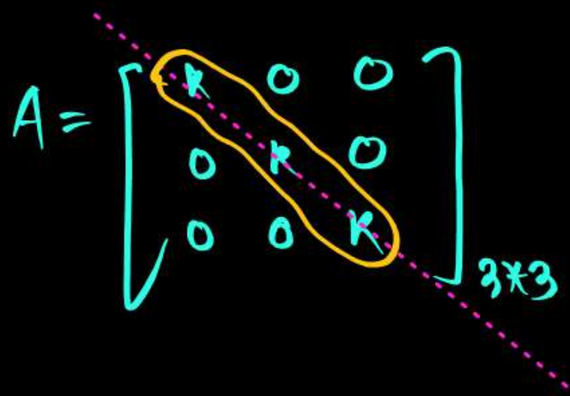


$A = \text{Diag}\{a, b, c\}$

$$A = [a_{ij}]_{m \times m} = 0 \; ; \; i \neq j$$

6 SCALER MATRIX

→ A ***Diagonal matrix***, having **same elements** at the Principle Diagonals.



$$A = [a_{ij}]_{m \times m} = \begin{cases} K \; ; \; i = j \\ 0 \; ; \; i \neq j \end{cases}$$

Question: CUET 2026 PYQs

Which of the following matrices are diagonal matrices?

A. $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 3 \end{bmatrix}$

B. $\begin{bmatrix} 1 & 2 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 3 \end{bmatrix}$

C. $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

D $\begin{bmatrix} 2 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 2 \end{bmatrix}$

Choose the correct answer from the options given below:

A, B and C only

B, C and D only

A, C and D only

A, B and D only

Question – CUET 2025 PYQs

If $\begin{bmatrix} a-b & 0 & 0 \\ 0 & b-c & 0 \\ 0 & 0 & c-2 \end{bmatrix}$ is a scalar matrix such that $a+b+c=0$, then, which of the following are TRUE?

(A) $a=0$ (B) $b=0$ (C) $a=1$ (D) $c=1$

Choose the correct answer from the options given below:

A. (A) and (C) only

B. (B) and (D) only

C. (C) and (D) only

D. (A), (C) and (D) only

$a-b=b-c=c-2$ ~ (1)

$a+b+c=0$ ~ (2)

$b+c=-a$

$a-b=c-2$

$a=b+c-2$

$a=-a-2$

$2a=-2$

$a=-1$

$a-b=b-c$

$a+c=2b$

$-b=2b$

$3b=0$

$b=0$

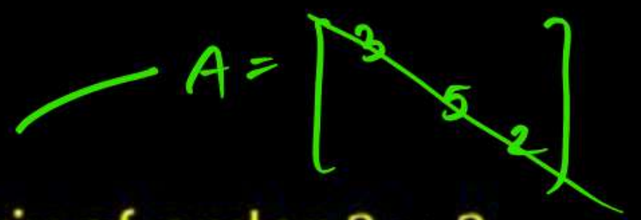
$a+c=-b$

$a+b+c=0$

$-1+0+c=0$

$c=1$

Question – CBSE 2025 PYQs [MCQS]



Assertion (A) : $A = \text{diag}\,[3 \quad 5 \quad 2]$ is a scalar matrix of order 3×3.

Reason (R) : If a diagonal matrix has all non-zero elements equal, it is known as a scalar matrix.

A Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

B Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).

C Assertion (A) is true, but Reason (R) is false.

D Assertion (A) is false, but Reason (R) is true.

If $A = \begin{bmatrix} 7 & 0 & x \\ 0 & 7 & 0 \\ 0 & 0 & y \end{bmatrix}$ is a scalar matrix, then y^x is equal to

A. 0

B. 1

C. 7

D. ± 7

$y = 7$

$x = 0$

$y^x = 7^0 \Rightarrow 1$

7 UNIT MATRIX/ IDENTITY MATRIX

→ A **Scaler matrix**, having Diagonal Elements is **ONE.**

→ It is represented by I_n (n: order of Identity Matrix)

$$I_2 = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}_{2\times 2}$$

$$I_3 = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}_{3\times 3}$$

$$I_m = [a_{ij}]_{m*m} = \begin{cases} 1 ; i=j \\ 0 ; i\neq j \end{cases}$$

8 NULL/ZERO MATRIX

→ A Matrix having all its elements is Zero

→ It is represented by O

→ **Null matrix can be any order**

$$O = \begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}_{2*3}$$

[It Can be Rectangular or Square Both]

$$O = \begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}_{3\times 3}$$

Question – CUET 2025 PYQs

Match List-I with List-II

List-I	List-II
Type of matrix	Conditions
(A) Square matrix A (II)	(I) $A = [a_{ij}]_{m\times m}$ where $\begin{cases} a_{ij} = 0 & , i \neq j \\ a_{ij} = k & , i = j \end{cases}$, where $k \neq 0$ is constant.
(B) Scalar Matrix A (I)	(II) $A = [a_{ij}]_{m\times m}$
(C) Diagonal matrix A (IV)	(III) $A = [a_{ij}]_{m\times m}$ where $\begin{cases} a_{ij} = 0 & , i \neq j \\ a_{ij} = 1 & , i = j \end{cases}$
(D) Identity matrix A (III)	(IV) $A = [a_{ij}]_{m\times m}$ where $a_{ij} = 0, i \neq j$

Question – CUET 2025 PYQs

Choose the correct answer from the options given below:

A (A) - (II), (B) - (IV), (C) - (I), (D) - (III)

B (A) - (II), (B) - (IV), (C) - (III), (D) - (I)

C (A) - (II), (B) - (I), (C) - (III), (D) - (IV)

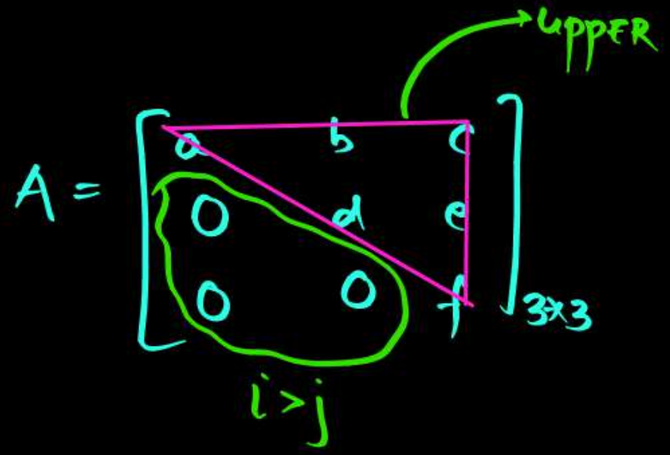
D (A) - (II), (B) - (I), (C) - (IV), (D) - (III)

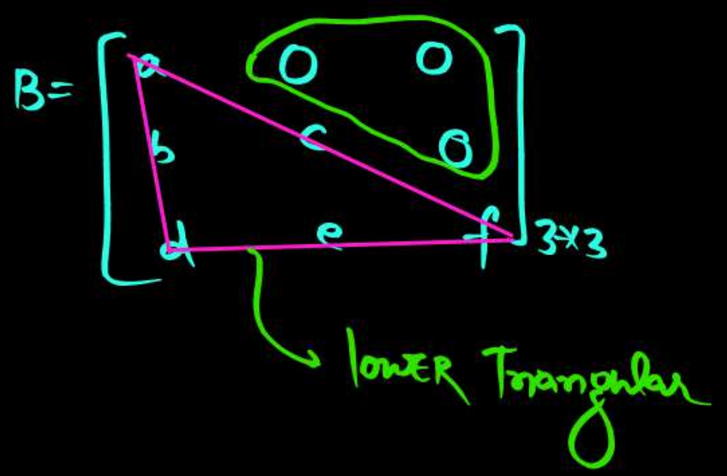
TYPES OF MATRIX

9

TRIANGULAR MATRIX

→ A **Square matrix**, having all its elements are Zero, either above the Principle Diagonals, or below to the principle diagonals.





$$A=[a_{ij}]_{m\times m}=0;\ i>j$$

$$A=[a_{ij}]_{m\times m}=0;\ i<j$$

Question: CUET 2026 PYQs

List-I	List-II
(A) $a_{ij} = \begin{cases} \frac{3j}{2i}, & \forall i = j \\ 0, & \forall i \neq j \end{cases}$	(I). Lower Triangular Matrix
(B). $a_{ij} = \begin{cases} 2i + 3j, & \forall i \geq j \\ 0, & \forall i < j \end{cases}$	(II). Identity Matrix
(C) $a_{ij} = \begin{cases} i^2 + j^2, & \forall i \leq j \\ 0, & \forall i > j \end{cases}$	(III). Scalar Matrix
(D) $a_{ij} = \begin{cases} \frac{i}{j}, & \forall i = j \\ 0, & \forall i \neq j \end{cases}$	(IV). Upper Triangular Matrix
Choose the correct answer from the options given below:	
1. (A) - (III), (B) - (I), (C) - (IV), (D) - (II)	
2. (A) - (II), (B) - (III), (C) - (IV), (D) - (I)	
3. (A) - (III), (B) - (II), (C) - (IV), (D) - (I)	
4. (A) - (I), (B) - (IV), (C) - (III), (D) - (II)	

Question: CUET 2026 PYQs

If the matrix $A = \begin{bmatrix} -2 & 0 & 0 \\ 0 & 3 & 0 \\ 0 & 0 & 4 \end{bmatrix}$ is given, then which of the following statements is/are TRUE?

A. A is a square matrix
B. A is a symmetric matrix
C. A is a scalar matrix
D. A is a identity matrix

Choose the correct answer from the options given below:

a) A, B, C and D

b) A, B and C only

c) A and B only

d) A only

Question: CUET 2026 PYQs

If a matrix has 7 elements, then it can be a

(A)Scalar matrix [SQUARE]

(B)Symmetric matrix [SQUARE]

(C)Column matrix ✓

(D)Row matrix ✓

$7 = 1 * 7 \Rightarrow$ Row

$\Rightarrow 7 * 1 \equiv$ Column

Choose the correct answer from the options given below:

1. (A), (B), (C) and (D)
2. (A) and (B) only
3. (C) and (D) only ✓
4. (B), (C) and (D) only

Question: CUET 2026 PYQs

Match List-I with List-II

List-I	List-II
(A) $\begin{bmatrix} 5 & 3 \\ -7 & 1 \end{bmatrix} + \begin{bmatrix} 7 & 3 \\ 7 & 2 \end{bmatrix}$	(I) Identity matrix
(B) $\begin{bmatrix} 5 & 3 \\ -7 & 1 \end{bmatrix} + \begin{bmatrix} -4 & -3 \\ -6 & 0 \end{bmatrix}$	(II) Upper Triangular Matrix
(C) $\begin{bmatrix} 5 & -3 \\ -2 & -1 \end{bmatrix} + \begin{bmatrix} -5 & 3 \\ 2 & 1 \end{bmatrix}$	(III) Zero Matrix
(D) $\begin{bmatrix} 5 & 13 \\ -2 & 6 \end{bmatrix} + \begin{bmatrix} -4 & -13 \\ 2 & -5 \end{bmatrix}$	(IV) Lower Triangular Matrix

Choose the correct answer from the options given below:

1. (A) - (II), (B) - (IV), (C) - (III), (D) - (I)
2. (A) - (IV), (B) - (II), (C) - (III), (D) - (I)
3. (A) - (II), (B) - (I), (C) - (IV), (D) - (III)
4. (A) - (II), (B) - (III), (C) - (IV), (D) - (I)

Question – CBSE 2024 PYQs

If $\begin{bmatrix} a & c & 0 \\ b & d & 0 \\ 0 & 0 & 5 \end{bmatrix}$ is a scalar matrix, then the value of $a + 2b + 3c + 4d$ is:

A. 0

B. 5

C. 10

D. 25

$a = d = 5$
$b = c = 0$

$5 + 4(5)$

$\Rightarrow 25$

Question: CUET 2025 PYQs

Match List-I with Lit-II

List-I	List-II
Type of matrix	**Conditions**
(A) Square matrix A (II)	(I) $A = [a_{ij}]_{m\times m}$ where $\begin{cases} a_{ij} = 0 & , i \neq j \\ a_{ij} = k & , i = j \end{cases}$, where $k \neq 0$ is constant.
(B) Scalar Matrix A (I)	(II) $A = [a_{ij}]_{mxxm}$
(C) Diagonal matrix A (IV)	(III) $A = [a_{ij}]_{m\times m}$ where $\begin{cases} a_{ij} = 0 & , i \neq j \\ a_{ij} = 1 & , i = j \end{cases}$
(D) Identity matrix A (III)	(IV) $A = [a_{ij}]_{m\times m}$ where $a_{ij} = 0, i \neq j$

Choose the correct answer from the options given below:

A (A) - (II), (B) - (IV), (C) - (I), (D) - (III)

B (A) - (II), (B) - (I), (C) - (III), (D) - (IV)

C (A) - (II), (B) - (IV), (C) - (III), (D) - (I)

D (A) - (II), (B) - (I), (C) - (IV), (D) - (III)

Question – CBSE 2024 PYQs

The number of all scalar matrices of order 3, with each entry −1, 0 or 1, is :

A. 1

B. 3

C. 2

D. 3^9

$$A = \begin{bmatrix} k & 0 & 0 \\ 0 & k & 0 \\ 0 & 0 & k \end{bmatrix}_{3\times 3}$$

$$A = \begin{bmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{bmatrix}$$

$$A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

Scalar ✗

$$A = \begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

Question – CUET 2023 PYQs

C

The matrix $A = \begin{bmatrix} 0 & 0 & 5 \\ 0 & 5 & 0 \\ 0 & 0 & 5 \end{bmatrix}$ is a :

3×3

A Scalar matrix ✗

B Diagonal matrix ✗

C Zero matrix ✗

D Square matrix ✓

Question – CUET 2023 PYQs

C

The order of a null matrix is :

A 0

B 1

C 2

D any order



Algebra of Two Matrix

[10]

- Addⁿ
- Equality
- Multiplcⁿ
- λ[ ]
- Common

1 EQUALITY OF TWO MATRIX

→ *Two Matrix,* $A=[a_{ij}]_{m\times n}$ & $B=[b_{ij}]_{p\times q}$

Are said to be equal iff.....

→CONDITION

→ *Order should be equal*

$\left(\begin{matrix} m=p \\ n=q \end{matrix}\right) \cap$

→How to equal?

Corresponding Elements should be equal

↳ $a_{ij}=b_{ij}\ \forall\ i,j$

$$\begin{bmatrix} x & y \\ z & w \end{bmatrix}_{2\times 2} = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}_{2\times 2}$$

$$\left[\begin{array}{c|c} x=1 & z=3 \\ y=2 & w=4 \end{array}\right]$$

2 ADDITION OF TWO MATRIX

→ *Two Matrix,*

$A = [a_{ij}]_{m \times n}$ & $B = [b_{ij}]_{p \times q}$

Can be Added, iff.....

→CONDITION

→ *Order should be equal*

$(m = p \;\&\; n = q)$

→How to Added?

Corresponding Elements will be added

$a_{ij} + b_{ij} \;\forall\; i \& j$

$$\begin{bmatrix} x & y \\ z & w \end{bmatrix} + \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$$

$$\Rightarrow \begin{bmatrix} x+1 & y+2 \\ z+3 & w+4 \end{bmatrix}_{2 \times 2}$$

Question – CUET 2023 PYQs

C

If A and B are two matrices of orders $3 \times p$ and $3 \times q$ respectively, and $p = q$, then the order of $(2A - 5B)$ is:

A $3 \times q$

B $p \times q$

C 3×3

D $p \times 3$

$2[A]_{3*p} - 5[B]_{3*q}$

$p = q$

$(3*p \;\; 3*q)$

Question – CUET 2023 PYQs

C

If A and B are two matrices of order $4 \times m$ and $4 \times n$, respectively and $m = n$ then the order of matrix $(5A - 2B)$ is :

A $4 \times m$

B 4×4

C 3×3

D $m \times 4$

$5[A]_{4*m} - 2[B]_{4*n}$

$(m = n)$

$(4*m \quad 4*n)$

Question – CUET 2023 PYQs

The value of $a + b + c + d$ if $\begin{bmatrix} 2a+b & a+2b \\ 2c+d & c+2d \end{bmatrix} = \begin{bmatrix} 8 & 4 \\ 3 & 3 \end{bmatrix}$ is

A. 4

B. 2

C. 6

D. 8

$$\begin{bmatrix} 2a+b=8 \\ a+2b=4 \\ 2c+d=3 \\ c+2d=3 \end{bmatrix} \quad (+)$$

$$3(a+b+c+d) = 18$$

$$a+b+c+d = 6$$

Question – CUET 2023 PYQs

If $A = \begin{bmatrix} 2-x & 1 \\ 3 & y+2 \end{bmatrix}$ and $B = \begin{bmatrix} y & 1 \\ 3 & 2x+1 \end{bmatrix}$ are such that $A = B$, then values of x and y are respectively :

A 1,3

B 3,1

C 2,1

D 1,1

$A = B$

$2 - x = y$

$x + y = 2$

$y + 2 = 2x + 1$

$2x - y = 1$

$x + y = 2$

$3x = 3$

$x = 1$

$y = 1$

Question – CUET 2023 PYQs

If $\begin{bmatrix} x+y+z+w \\ x+y \\ x+z \\ x+w \end{bmatrix} = \begin{bmatrix} 10 \\ 6 \\ 5 \\ 3 \end{bmatrix}$, find the value of $x^2+y^2-(w+z)^2$

A 16

B 20

C 4

D 8

$x+y+z+w=10$ — (1)

$x+y=6$ — (2)

$x+z=5$ — (3)

$x+w=3$ — (4)

(1) − (3) and (2) − (4):

$z-w=2$

$z-w=2$

$6+z+w=10$

$z+w=4$

$z-w=2$

$2z=6$

$z=3$

$w=1$

$x+3=5$

$x=2$

$2+y=6$

$y=4$

$\Rightarrow 4+16-(16)$

$\Rightarrow 4$

3 MULTIPLICATION OF TWO MATRIX

→ Multiplication of Two Matrix $A=[a_{ij}]_{m\times n}$ $B=[b_{ij}]_{p\times q}$ Is represented by

$A\cdot B$ OR AB OR $A\times B$

→CONDITION

→ **Number of Column of 1st Matrix = No of Row of 2nd Matrix**

$(n=p)$

→How to Multiply?

Row by Column Method

$[a_{ij}]_{m*n} \cdot [b_{ij}]_{p*q} = [c_{ij}]_{m*q}$

If $n=p$

Question: CUET 2026 PYQs

If A, B, C and D are matrices of order $2 \times n, 3 \times k, 2 \times p$ and $n \times 3$ respectively and AB + CD defined, then order of DB is:

A. 2×3

B. 3×2

C. 2×2

D. 3×3

$[A]_{2\times n}\,[B]_{3\times k} + [C]_{2\times p}\,[D]_{n\times 3}$

$n = 3$, $p = n$

$p = n = 3$

$k = 3$

Order of $[D][B]$

$[D]_{n\times 3} \cdot [B]_{3\times k}$

$[DB]_{n\times k}$

3×3

$[AB]_{2\times k} + [CD]_{2\times 3}$

$k = 3$

Question: CUET 2026 PYQs

If $A = \begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix}$ satisifies the equation $A^2 - KA + I = 0$, then the value of K is (Where I is an identity matrix of order 2)

A. 4

B. 3

C. 2

D. 1

$A^2 = \begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix}\begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix}$

$A^2 \Rightarrow \begin{bmatrix} 7 & 12 \\ 4 & 7 \end{bmatrix}$

$A^2 - KA + I = 0$

$\begin{bmatrix} 7 & 12 \\ 4 & 7 \end{bmatrix} - K\begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix} + \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} = 0$

$\begin{bmatrix} 7 & 12 \\ 4 & 7 \end{bmatrix} - \begin{bmatrix} 2k & 3k \\ k & 2k \end{bmatrix} + \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} = 0$

$7 - 2k + 1 = 0$

$2k = 8$

$k = 4$

$\begin{bmatrix} 7-2k+1 & \\ & \end{bmatrix} = \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$

Question: CUET 2026 PYQs

If $\begin{bmatrix} 0 & x \\ 2 & 1 \end{bmatrix} + 2\begin{bmatrix} 3 & 1 \\ y & 0 \end{bmatrix} = \begin{bmatrix} 6 & 5 \\ 8 & 1 \end{bmatrix}$, then the value of $2x + 3y$ is :

A. 15

B. 13

C. 11

D. 17

$$\begin{bmatrix} 0 & x \\ 2 & 1 \end{bmatrix} + \begin{bmatrix} 6 & 2 \\ 2y & 0 \end{bmatrix} = \begin{bmatrix} 6 & 5 \\ 8 & 1 \end{bmatrix}$$

$$\begin{bmatrix} 6 & x+2 \\ 2y+2 & 1 \end{bmatrix} = \begin{bmatrix} 6 & 5 \\ 8 & 1 \end{bmatrix}$$

$x+2=5$

$x=3$

$2y+2=8$

$2y=6$

$y=3$

$\Rightarrow 2(3)+3(3) \Rightarrow 6+9=15$

Question: CUET 2026 PYQs

If A and B are two square matrices of the same order such that $(A+B)^2 = A^2 + B^2$, then

A. $A^2 + B^2 = O$

B. $AB = 0$

C. $BA = 0$

D. $AB = -BA$ ✓

$(A+B)^2 = (A+B)(A+B)$

$\Rightarrow A\cdot(A+B) + B(A+B)$

$\Rightarrow A\cdot A + AB + BA + B\cdot B$

$\Rightarrow A^2 + AB + BA + B^2 = A^2 + B^2$

$AB + BA = 0$

$AB = -BA$

Question: CUET 2026 PYQs

If $A = \begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$ and $f(x) = x^2 - 2x - 3$, then $f(A)$ is

A. $\begin{bmatrix} 3 & 0 \\ 0 & 3 \end{bmatrix}$

B. Zero matrix

C. $\begin{bmatrix} 5 & 4 \\ 4 & 5 \end{bmatrix}$

D. Identity matrix

$f(A) = A^2 - 2A - 3$

$A^2 = \begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}\begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$

$A^2 \Rightarrow \begin{bmatrix} 5 & 4 \\ 4 & 5 \end{bmatrix}$

$A^2 - 2A - 3I$

$\Rightarrow \begin{bmatrix} 5 & 4 \\ 4 & 5 \end{bmatrix} - 2\begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix} - 3\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

$\Rightarrow \begin{bmatrix} 5 & 4 \\ 4 & 5 \end{bmatrix} - \begin{bmatrix} 2 & 4 \\ 4 & 2 \end{bmatrix} - \begin{bmatrix} 3 & 0 \\ 0 & 3 \end{bmatrix}$

$\Rightarrow \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$

Question: CUET 2026 PYQs

The value (/s) of x satisfying the matrix equation:

$$x\begin{bmatrix}2x & 2\\ 3 & x\end{bmatrix}+2\begin{bmatrix}8 & 5x\\ 4 & 4x\end{bmatrix}=2\begin{bmatrix}(x^2+8) & 24\\ 10 & 6x\end{bmatrix}$$ is/are:

A. $x=0$ and $x=4$

B. $x=0$ only

C. $x=4$ only

D. $x=0$ and $x=-2$

$$\begin{bmatrix}2x^2 & 2x\\ 3x & x^2\end{bmatrix}+\begin{bmatrix}16 & 10x\\ 8 & 8x\end{bmatrix}=\begin{bmatrix}2(x^2+8) & 48\\ 20 & 12x\end{bmatrix}$$

$$\begin{bmatrix}2x^2+16 & 12x\\ 3x+8 & x^2+8x\end{bmatrix}=\begin{bmatrix}2(x^2+8) & 48\\ 20 & 12x\end{bmatrix}$$

$3x+8=20$

$x=4$

$x^2+8x=12x$

$x^2-4x=0$

$x(x-4)=0$

$x=0$, $x=4$

Question: CUET 2026 PYQs

If $A = \begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix}, I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ and $A^2 = \alpha A + \beta I$, for some constant α and β then the value of α and β respectively:

A. $-4, -1$

B. $-4, 1$

C. $4, 1$

D. $4, -1$

$A^2 = \begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix}\begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix}$

$A^2 \Rightarrow \begin{bmatrix} 7 & 12 \\ 4 & 7 \end{bmatrix}$

$A^2 = \alpha A + \beta I$

$\begin{bmatrix} 7 & 12 \\ 4 & 7 \end{bmatrix} = \alpha\begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix} + \beta\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

$\begin{bmatrix} 7 & 12 \\ 4 & 7 \end{bmatrix} = \begin{bmatrix} 2\alpha & 3\alpha \\ \alpha & 2\alpha \end{bmatrix} + \begin{bmatrix} \beta & 0 \\ 0 & \beta \end{bmatrix}$

$\begin{bmatrix} 7 & 12 \\ 4 & 7 \end{bmatrix} = \begin{bmatrix} 2\alpha+\beta & 3\alpha \\ \alpha & 2\alpha+\beta \end{bmatrix}$

$\alpha = 4$

$2\alpha + \beta = 7$

$8 + \beta = 7$

$\beta = -1$

Question: CUET 2026 PYQs

If $A = \begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$ and $f(x) = x^2 - 2x - 3$, then $f(A)$ is equal to

A. I, where I is identity matrix of order 2.

B. O (Null matrix)

C. $2I$, where I is identity matrix of order 2.

D. $-I$, where I is identity matrix of order 2.

$f(A) = A^2 - 2A - 3I$

HW

Question: CUET 2026 PYQs

If $A + B = \begin{bmatrix} 7 & 0 \\ 2 & 5 \end{bmatrix}$ and $A - B = \begin{bmatrix} 3 & 0 \\ 0 & 3 \end{bmatrix}$, then

A. $A = \begin{bmatrix} 5 & 0 \\ 1 & 4 \end{bmatrix}, B = \begin{bmatrix} 2 & 0 \\ 1 & 1 \end{bmatrix}$

B. $A = \begin{bmatrix} 2 & 0 \\ 1 & 1 \end{bmatrix}, B = \begin{bmatrix} 5 & 0 \\ 1 & 4 \end{bmatrix}$

C. $A = \begin{bmatrix} 10 & 0 \\ 2 & 8 \end{bmatrix}, B = \begin{bmatrix} 4 & 0 \\ 2 & 2 \end{bmatrix}$

D. $A = \begin{bmatrix} 4 & 0 \\ 2 & 2 \end{bmatrix}, B = \begin{bmatrix} 10 & 0 \\ 2 & 8 \end{bmatrix}$

$A+B = \begin{bmatrix} 7 & 0 \\ 2 & 5 \end{bmatrix}$

$A-B = \begin{bmatrix} 3 & 0 \\ 0 & 3 \end{bmatrix}$

$2A = \begin{bmatrix} 10 & 0 \\ 2 & 8 \end{bmatrix}$

$A = \begin{bmatrix} 5 & 0 \\ 1 & 4 \end{bmatrix}$

Question: CUET 2026 PYQs

If $A = \begin{bmatrix} 5 & 0 & 0 \\ 0 & 5 & 0 \\ 0 & 0 & 5 \end{bmatrix}$ such that $A^5 = \lambda^2 A$, then the value of λ is

A. 25

B. -25

C. ± 25

D. 125

Question: CUET 2026 PYQs

If A and B are two square matrices of order 'n', where $AB \neq BA$, then

A. $(A+B)^2 = A^2 + 2AB + B^2$ ✗

B. $(A+B)^2 = A^2 + 2BA + B^2$ ✗

C. $(A+B)^2 = A^2 + AB + BA + B^2$ ✓

D. $A^2 - B^2 = (A+B)(A-B)$

$(A+B)^2 = (A+B)\cdot(A+B)$

$\Rightarrow A\cdot(A+B) + B\cdot(A+B)$

$\Rightarrow A\cdot A + A\cdot B + B\cdot A + B\cdot B$

$\Rightarrow A^2 + A\cdot B + BA + B^2$

Question: CUET 2026 PYQs

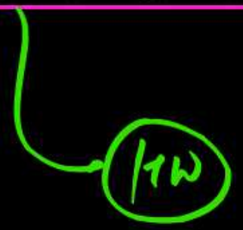
If A is a square matrix such that $A^2 = I$, then $(A + I)^3 + (A - I)^3 - 7A$ is equal to

A. A

B. $A - I$

C. $A + I$

D. 3A



Question: CUET 2026 PYQs

If $A = \begin{bmatrix} 2 & -3 & -5 \\ -1 & 4 & 5 \\ 1 & -3 & -4 \end{bmatrix}$, then A^2 is equal to :

A. $\begin{bmatrix} 2 & -3 & -5 \\ -1 & 4 & 5 \\ 1 & -3 & -4 \end{bmatrix}$

B. $\begin{bmatrix} 2 & -1 & 1 \\ -3 & 4 & -3 \\ -5 & 5 & -4 \end{bmatrix}$

$\Rightarrow \begin{bmatrix} & & \\ & -3 & \\ & & \end{bmatrix}$

$C_{32} = -3 - 12 + 12$

(c) $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

(d) $\begin{bmatrix} 4 & 9 & 25 \\ 1 & 16 & 25 \\ 1 & 9 & 16 \end{bmatrix}$

Question: CUET 2026 PYQs

If $A = \begin{bmatrix} 2 & -1 & 3 \\ 4 & 5 & -6 \end{bmatrix}_{2\times3}$ and $B = \begin{bmatrix} 1 & 2 \\ 3 & 4 \\ 5 & -6 \end{bmatrix}_{3\times2}$ then

A. Only AB is defined

B. Only BA is defined

C. AB and BA are both defined

D. AB and BA both are not defined

$[A]_{2\times3}\,[B]_{3\times2} \rightarrow AB$

$[B]_{3\times2}\,[A]_{2\times3} \rightarrow [BA]_{3\times3}$

Question – CUET 2025 PYQs

Match List-I with List-II

List-I	List-II
Matrix Product	Order of resultant matrix
(A) $[a_{ij}]_{2\times3} \times [b_{ij}]_{3\times4}$	(I) 2×4
(B) $[a_{ij}]_{2\times1} \times [b_{ij}]_{1\times3}$	(II) Not possible
(C) $[a_{ij}]_{3\times2} \times [b_{ij}]_{3\times2}$	(III) 3×3
(D) $[a_{ij}]_{3\times3} \times [b_{ij}]_{3\times3}$	(IV) 2×3

Question – CUET 2025 PYQs

Choose the correct answer from the options given below:

A (A) - (I), (B) - (II), (C) - (IV), (D) - (III)

B (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

C (A) - (I), (B) - (IV), (C) - (II), (D) - (III)

D (A) - (III), (B) - (II), (C) - (I), (D) - (IV)

Question – CUET 2025 PYQs

If $A = \begin{bmatrix} 2 & 1 & 3 \\ 4 & -3 & 5 \end{bmatrix}_{2\times3}$ and $B = \begin{bmatrix} -2 & 3 \\ 4 & -5 \\ 1 & 2 \end{bmatrix}_{3\times2}$, then which of the following statements are TRUE?

(A) AB is defined

(B) AB and BA both are defined and $AB = I$, where 1 is an identity matrix of order 2

(C) BA is defined

(D) AB and BA both are defined and $AB \neq BA$

Choose the correct answer from the options given below:

A (A), (B) and (C) only

B (B), (C) and (D) only

C (A) and (C) only

D (A), (C) and (D) only

Question – CUET 2025 PYQs

Let A, B, C, D and E be matrices of order $2 \times n, 3 \times k, 2 \times p, n \times 3$ and $p \times k$ respectively. Choose the correct statement(s) from the following?

(A) $EB + DB$ will be defined if $k = 3, p = n$.

(B) $EB + DB$ will be defined if $k = 2, p = 3$.

(C) If $n = p = 2$, then the order of the matrix $5A^2 - 3C$ is 2×2.

(D) If $n = p$, then the order of the matrix $5A^2 - 3C$ is $p \times k$.

Choose the correct answer from the options given below:

(1) (A) and (D) only

(2) (A) and (C) only

(3) (B) and (D) only

(4) (A) only

Question – CUET 2025 PYQs

If P,Q and R are matrices of order 2×3, 3×5 and 5×3 respectively. Then which of the following are valid?

A. PQR

B. PRQ

C. QR

D. RQ

E. PR

Choose the correct answer from the options given below:

A. (A), (C) and (D) only

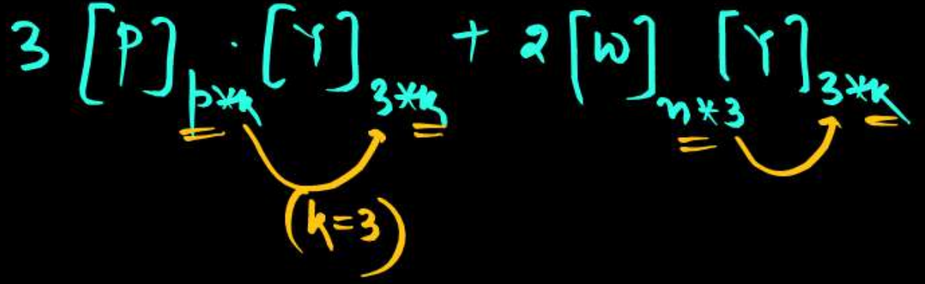
B. (B), (C) and (D) only

C. (A), (B), (C) and (D) only

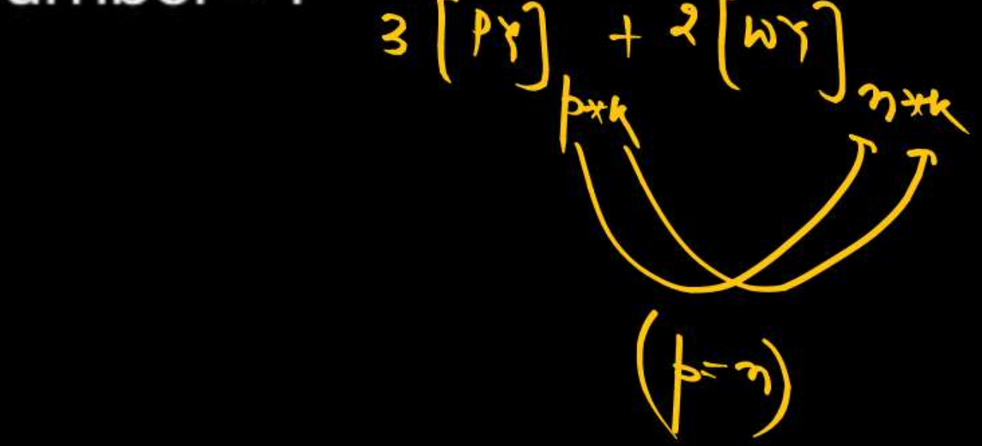
D. (A), (B), (D) and (E) only

Question: CUET 2026 PYQs

Given that Y_{3xk}, $W_{n\times3}$ and $P_{p\times k}$ are matrices of specified order, then the condition for n, p, k so that 3PY + 2 WY is well defined, is:



1. $p = n \& k = 3$
2. $2p = n \ \& \ k = 3$
3. $p = 2n \& k$ is any natural number > 1
4. $p = n + 2 \ \& \ k = 2$



QUESTION- 2 [1 MARKS]

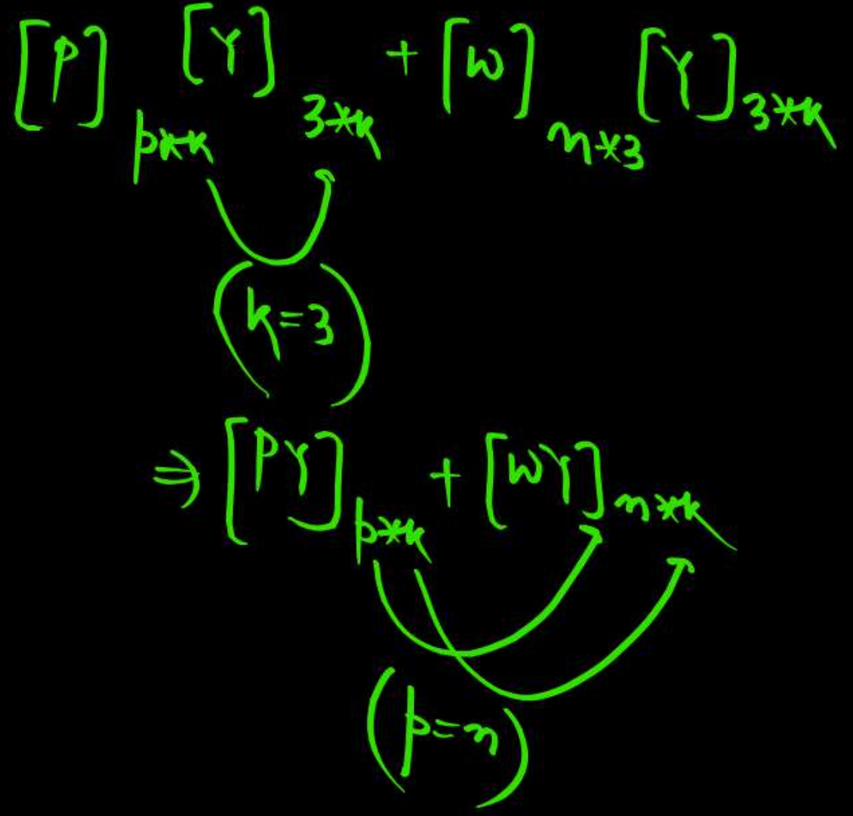
Q. Assume X, Y, Z, W and P are matrices of order $2 \times n, 3 \times k, 2 \times p, n \times 3$ and $p \times k$, respectively. Then the restriction on n, k and p so that $PY + WY$ will be defined are:

A $k = 3, p = n$

B k is arbitrary, $p = 2$

C p is arbitrary, $k = 3$

D $k = 2, p = 3$



Question

$$\begin{bmatrix}1 & x & 1\end{bmatrix}\begin{bmatrix}1 & 3 & 2\\ 2 & 5 & 1\\ 15 & 3 & 2\end{bmatrix}\begin{bmatrix}1\\ 2\\ x\end{bmatrix} = 0, \text{ if } x =$$

A. -7

B. -11

C. -2

D. 14

4 MULTIPLICATION OF A MATRIX BY SCALER

→ *If we multiply any constant, it is multiplied in each and every elements of a Matrix.*

$$A = \begin{bmatrix} 2 & 3 \\ 4 & 5 \end{bmatrix}$$

$$kA = \begin{bmatrix} 2k & 3k \\ 4k & 5k \end{bmatrix}_{2*2}$$

5

HOW TO TAKE COMMON FROM THE MATRIX

→ *If we take common from a matrix, it comes from each and every elements of a Matrix.*

$$A = \begin{bmatrix} 2 & 4 \\ 6 & 8 \end{bmatrix}$$

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



Important NOTE



→ *If we multiply a matrix with identity matrix we get same matrix*

$$AI = IA = A$$

→ *Nth power of Identity matrix is also a identity matrix*

$$I^N = I$$

$I^2 = I$ $I^5 = I$

$I^3 = I$

→ **Let A and B are two matrix,** *if* $AB = 0$ ≡ *It doesn't mean that either* $A = 0$ *or* $B = o$

(Turn)(Turn) = 0



Positive Integral Power of a Square Matrix

→ Let we have a square matrix A, then.....

$A^2 = A \cdot A$

$A^3 = \underbrace{A \cdot A \cdot A}_{3\text{ times}} = A^2 \cdot A = A \cdot A^2$

$A^4 = \underbrace{A \cdot A \cdot A \cdot A}_{4\text{ times}} = A^3 \cdot A = A \cdot A^3 = A^2 \cdot A^2$

$\vdots$

$A^n = \underbrace{A \cdot A \cdot A \cdots A}_{n\text{ times}} = A^{n-1} \cdot A = A \cdot A^{n-1}$

Question: CUET 2026 PYQs

If A is a square matrix such that $A^2 = A$, then $(I + A)^3$ is equal to

A. I+ 7A

B. I+ 6A

C. I+ 4A

D. I+8 A

$A^3 = A^2 \cdot A$

$\Rightarrow A \cdot A$

$\Rightarrow A^2$

$A^3 \Rightarrow A$

$\Rightarrow I^3 + A^3 + 3I^2A + 3A^2I$

$\Rightarrow I + A + 3I \cdot A + 3A \cdot I$

$\Rightarrow I + A + 3A + 3A$

$\Rightarrow I + 7A$

Question – CUET 2025 PYQs

$A^2 = I$

$A^3 = A^2 \cdot A \Rightarrow I \cdot A \Rightarrow A$

If A is a square matrix and I is the identify matrix of same order such that $A^2 = I$ then $3(A - I)^3 + 3(A + I)^3 - 15A$ is equal to

$3\left[A^3 - I^3 - 3AI(A-I) + A^3 + I^3 + 3AI(A+I)\right] - 15A$

$\Rightarrow 3\left[2A^3 - 3A^2I + 3AI^2 + 3A^2I + 3AI^2\right] - 15A$

$\Rightarrow 3\left[2A + 6A\right] - 15A$

$\Rightarrow 24A - 15A$

$\Rightarrow 9A$

A. 19 A

B. 9 A

C. 10 A

D. 5 A



Properties of Matrix Addition

- **Commutative Law**: Addition of two matrix is always commutative

$$A+B = B+A$$

- **Associative Law:** Addition of two matrix is always associative

$$A+(B+C) = (A+B)+C$$

- **Cancellation Law:** Cancellation law holds true in matrix addition

$$\text{If } A+B = A+C \text{ then } B=C$$

- **Distributive by a constant:**

$$m(A+B) = mA + mB \qquad m \in R$$

- **Existence of an Identity**

$$A+0 = 0+A = A$$

- **Additive Inverse**

$$A+(-A) = (-A)+A = 0$$



Properties of Matrix Multiplications

$A \cdot B \equiv$ A is Pre-Multiply to B

B is Post Multiply to A

- **Commutative Law**: In general, matrix multiplication is not commutative.

$$AB \neq BA$$

- **Associative Law:** Multiplication of two matrix is always associative

$$A(BC) = (AB)C$$

- **Cancellation Law:** In general cancellation law doesn't holds true in matrix multiplication

$$\text{If } AB = AC \Rightarrow B \neq C$$

- **Distributive by a Matrix:**

$$A(B + C) = AB + AC$$

- **Existence of an Identity**

$$AI = IA = A$$

- ~~Additive~~ Multiplicative Inverse

$$A.A^{-1} = A^{-1}.A = I$$

Question: CUET 2026 PYQs

Let A, B, C be square matrices of equal orders and I be the identity matrix of same order, Then which of the following are TRUE?

A. $(AB)C = A(BC)$

B. $AB = BA$

C. $A(B + C) = AB + AC$

D. $AI = IA = A$

Choose the correct answer from the options given below:

a) A, B, C and D

b) A, C and D only

c) B, C and D only

d) A, B and C only

Question – CUET 2025 PYQs

If $\begin{bmatrix} ab & cd \\ a+c & b+d \end{bmatrix} = \begin{bmatrix} 2 & -3 \\ 4 & 1 \end{bmatrix}$ where a, b, c, d are integers, then which of the following are true?

(A) $a + d = 0$ (B) $b + d = 3$ (C) $b + d = 1$ (D) $c + d = 2$

Choose the correct answer from the options given below:

$ab = 2$, $cd = -3$ | $a + c = 4$, $b + d = 1$

A (A), (B) and (C) only

B (A), (C) and (D) only

C (B) and (C) only

D (B), (C) and (D) only

Question – CUET 2025 PYQs

If A is a square matrix such that $A^2 = A$ then which of the following statements are TRUE? (Where I is an identity matrix of same order as A)

(A) $(I + A)^4 = I + 15A$

(B) $(I + A)^2 = I + 3A$

(C) $(I + A)^6 = I + 30A$

(D) $(I + A)^3 = I + 7A$

Choose the correct answer from the options given below:

A (A) and (B) only

B (A), (B) and (C) only

C (A), (C) and (D) only

D (A), (B) and (D) only

$(I+A)^6 \Rightarrow (I+A)^4 \cdot (I+A)^2$

$\Rightarrow (I+15A)(I+3A)$

(B) $(I+A)^2 = I^2 + A^2 + 2I \cdot A \Rightarrow I + A + 2A \Rightarrow (I+3A)$

(D) $(I+A)^3 = (I+A)\cdot(I+A)^2 \Rightarrow (I+A)(I+3A)$

(A) $(I+A)^4 = (I+A)^2 \cdot (I+A)^2 \Rightarrow I^2 + 3AI + AI + 3A^2$

$\Rightarrow I + 4A + 3A$

$\Rightarrow I + 7A$

$\Rightarrow (I+3A)(I+3A)$

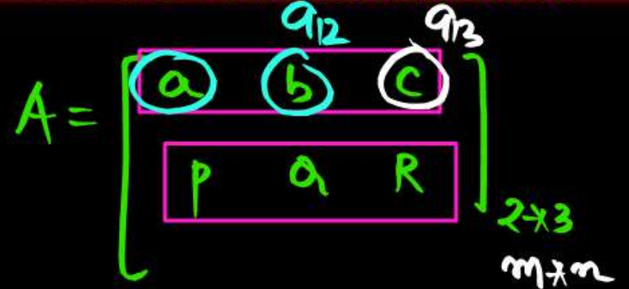
$\Rightarrow I^2 + 9A^2 + 3AI + 3AI$

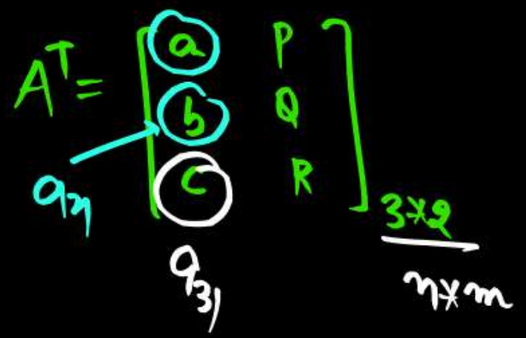
$\Rightarrow I + 9A + 6A$

$\Rightarrow (I + 15A)$

Transpose of a MATRIX

- The **transpose of a matrix** is obtained by changing its rows into columns (or equivalently, its columns into rows).





Note:

(I) Row ⟷ Column

(II) Loc^n of an Element In A is ij^{th} It will be a_{ji}^{th} In A^T.

(III) If Order of A is m×n; Then It will be n×m In A^T.



Properties of Transpose of a Matrix

(i) $(A^T)^T = A$

(ii) $(A \pm B)^T = A^T \pm B^T$

(iii) $(A \cdot B)^T = B^T \cdot A^T$

(iv) $(k \cdot A)^T = k \cdot A^T \quad (k \in R)$

(v) $(A^m)^T = (A^T)^m$ { Power & Transpose Can be Interchange }

Question: CUET 2026 PYQs

If matrix $A = \begin{bmatrix} 3 & x \\ y & 0 \end{bmatrix}$ and $A^T = A$, then

A. $x = y$

B. $x = 0, y = 3$

C. $x = 3, y = 0$

D. $x = 1, y = 2$

$A^T = A$

$\begin{bmatrix} 3 & y \\ x & 0 \end{bmatrix} = \begin{bmatrix} 3 & x \\ y & 0 \end{bmatrix}$

$x = y$

Question: CUET 2026 PYQs

If $A = \frac{1}{3}\begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & -2 \\ a & 2 & b \end{bmatrix}$ satisfies $AA^T = I_3$ (Identity matrix of order 3), then the value of a and b are:

A. $a = 2, b = 1$

B. $a = -2, b = -1$

C. $a = 1, b = 2$

D. $a = -1, b = -2$

$$A \cdot A^T = \frac{1}{3}\begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & -2 \\ a & 2 & b \end{bmatrix}\frac{1}{3}\begin{bmatrix} 1 & 2 & a \\ 2 & 1 & 2 \\ 2 & -2 & b \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$$\Rightarrow \frac{1}{9}\begin{bmatrix} 9 & 0 & a+4+2b \\ & & 2a+2-2b \\ & & \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$a+4+2b$

$a+2b = -4$

$a - b = -1$

$3b = -3$

$b = -1$

$\frac{a+4+2b}{9} = 0$

$a+2b = -4$

$a+1 = -1$

$a = -2$

$2a+2-2b = 0$

$2a-2b = -2$

$a-b = -1$

Question: CUET 2026 PYQs

If A is a 2×3 matrix and B is a matrix such that A^TB and BA^T are both defined. Then order of B is

A. 3×3

B. 2×2

C. 3×2

D. 2×3

$(A)_{2\times3}$ $(B)_{p*q}$

$(A^T)_{3\times2} \cdot (B)_{p*q}$

$p=2$

$(B)_{p*q}$ $(A^T)_{3\times2}$

$q=3$

Order of $B \Rightarrow p*q$

$\Rightarrow 2*3$

Question: CUET 2026 PYQs

If $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & -2 \\ m & 2 & n \end{bmatrix}$ is a matrix, such that $AA^T = 9I_3$, then the values of m and n are (where I_3 is an identity matrix of order 3)

A. $m = -2, n = 1$

B. $m = 2, n = -1$

C. $m = 2, n = 1$

D. $m = -2, n = -1$

$$\begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & -2 \\ m & 2 & n \end{bmatrix} \begin{bmatrix} 1 & 2 & m \\ 2 & 1 & 2 \\ 2 & -2 & n \end{bmatrix} = \begin{bmatrix} 9 & 0 & 0 \\ 0 & 9 & 0 \\ 0 & 0 & 9 \end{bmatrix}$$

$$\begin{bmatrix} m+4+2n & \\ 2m+2-2n & \end{bmatrix} = \begin{bmatrix} 9 & 0 & 0 \\ 0 & 9 & 0 \\ 0 & 0 & 9 \end{bmatrix}$$

$m + 4 + 2n = 0$

$\boxed{m + 2n = -4}$

$2m + 2 - 2n = 0$

$m + 1 - n = 0 \Rightarrow \boxed{m - n = -1}$

$m + 2n = -4$

$m - n = -1$

$3n = -3$

$\boxed{n = -1}$

$m + 1 = -1$

$\boxed{m = -2}$

Question: CUET 2026 PYQs

If A, B and C are square matrices of order $n \times n$, then which of the following are TRUE? [Where A^T is transpose of matrix A]

A. $(A+B)^T = A^T + B^T$

B. $(AB)^T = A^T B^T$

C. $(ABC)^T = C^T B^T A^T$

D. $(BA)^T = A^T B^T$

Choose the correct answer from the options given below:

(A), (B) and (C) only

(A) and (D) only

(A) and (B) only

(A), (C) and (D) only

Question: CUET 2026 PYQs

Which of the following are true about the properties of transpose of appropriate matrices?

A. $(A + B)^T = A^T + B^T$

B. $(A - B)^T = A^T - B^T$

C. $(AB)^T = A^T B^T$

D. $(kA)^T = k(A^T)$, where k is a scalar

Choose the correct answer from the options given below:

A, B and C only

B, C and D only

A, C and D only

A, B and D only

Question: CUET 2026 PYQs

If $P = \begin{bmatrix} 1 & 2 \\ -1 & 3 \end{bmatrix}, Q = \begin{bmatrix} 4 & 0 \\ 1 & 5 \end{bmatrix}$ and $R = \begin{bmatrix} 2 & 0 \\ 1 & -2 \end{bmatrix}$, then which of the following are TRUE?

A. $(P^T)^T = P^T$

B. $(P - Q)R = PR - QR$

C. $(P - Q)^T = Q^T - P^T$

D. $(PQ)^T = Q^T P^T$

Choose the correct answer from the options given below:

(A) and (C) only

(B) and (D) only

(A), (B) and (C) only

(B), (D) and (C) only

Question: CUET 2026 PYQs

If $A = \begin{bmatrix} 0 & x & x \\ 2y & y & -y \\ z & -z & z \end{bmatrix}$ such that $AA^T = 2I$ (where I is an identity matrix of order 3), then which of the following are True?

$x^2 : y^2 : z^2 = 1 : \frac{1}{3} : \frac{2}{3}$

A. $x^2 = 1, 3y^2 = 2$

B. $6y^2 = 4, 2z^2 = 3$

C. $9z^2 = 6, x^2 = 1$

D. $x^2 : y^2 : z^2 = 3 : 1 : 2$

$\Rightarrow 3:1:2$

$$\begin{bmatrix} 0 & x & x \\ 2y & y & -y \\ z & -z & z \end{bmatrix} \begin{bmatrix} 0 & 2y & z \\ x & y & -z \\ x & -y & z \end{bmatrix} = \begin{bmatrix} 2 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 2 \end{bmatrix}$$

Choose the correct answer from the options given below:

A. A and B only

B. B and C only

C. C and D only

D. A and D only

$2x^2 = 2 \Rightarrow x^2 = 1$

$6y^2 = 2 \Rightarrow y^2 = \frac{1}{3}$

$3z^2 = 2 \Rightarrow z^2 = 2/3$

$$\begin{bmatrix} 2x^2 & 0 & 0 \\ 0 & 6y^2 & 0 \\ 0 & 0 & 3z^2 \end{bmatrix} = \begin{bmatrix} 2 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 2 \end{bmatrix}$$

Question – CUET 2025 PYQs

If A is a matrix of order mxn and B is a matrix such that AB^T and B^TA are both well-defined matrices, then order of matrix B is

HW

A $n \times n$

B $m \times m$

C $m \times n$

D $n \times m$

Question – CUET 2023 PYQs

If the matrix $A = \begin{bmatrix} 0 & 2y & z \\ x & y & -z \\ x & -y & z \end{bmatrix}$ satisfies the equation $A^T A = I_3$, then $x^2 + y^2 + z^2$ is :

A 0

B 1

C 2

D 6

Question – CUET 2023 PYQs

C

Which of the following statements is incorrect regarding matrices ?
For any matrices A and B of suitable orders,

A $(\mathrm{A}')' = \mathrm{A}$

B $(\mathrm{KA})' = \mathrm{KA}'$ (Where K is any constant)

C $(A + B)' = B' + A'$

D $(\mathrm{AB})' = \mathrm{A}'\mathrm{B}'$

Question – CUET 2023 PYQs

If A is a $m \times n$ matrix and B is $n \times p$ matrix and $m \neq p$ then,

A $(AB)' = B'A'$

B $(BA)' = A'B'$

C $(AB)' = A'B'$

D $(BA)' = B'A'$

$(A)_{m*n}\ (B)_{n*p} \longrightarrow (AB)$ defined

$(B)_{n*p}\ (A)_{m*n}$ ✗



Symmetric Matrix

A square matrix A which is of size n × n, is considered to be symmetric if and only if

$$A^T = A$$

Here, aij = aji

$$A = \begin{bmatrix} a & b & c \\ b & d & e \\ c & e & f \end{bmatrix}_{3\times 3}$$

$$A^T = \begin{bmatrix} a & b & c \\ b & d & e \\ c & e & f \end{bmatrix} = A$$

Note: $A^T = A$

(I) Elements of opp side of P.D Must be Equal to Each other

i.e $a_{ij} = a_{ji}$ $\forall$ i ≠ j.

(II) No Restrictions on the P.D Elements of a Symm Matrix.

(IV) $$A = \begin{bmatrix} a & 0 & 0 \\ 0 & b & 0 \\ 0 & 0 & c \end{bmatrix}_{3\times 3}$$ ← diagonal Matrix is Always Symm Matrix

Question: CUET 2026 PYQs

The matrix $\begin{bmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$ is

3*3

1. an identity matrix ✗
2. a diagonal matrix ✗
3. a scalar matrix ✗
4. a symmetric matrix

Question

If the matrix $\begin{bmatrix} 3 & a+b & 4 \\ 2 & 0 & -1 \\ a-b & c & 5 \end{bmatrix}$ is symmetric, then the value of a, b and c is given by:

A $a = 3,\ b = -1, c = -1$

B $a = 3, b = -1, c = 1$

C $a = -3, b = 1, c = -1$

D $a = -3, b = 1, c = 1$

$a+b = 2$

$a-b = 4$

$2a = 6$

$a = 3$

$3+b = 2$

$b = -1$

$c = -1$



Skew – Symmetric Matrix

A square matrix A which is of size n × n, is considered to be skew-symmetric if and only if

$A^T = -A$.

Here, $a_{ij} = -a_{ji}$

$$A = \begin{bmatrix} 0 & a & b \\ -a & 0 & -c \\ -b & c & 0 \end{bmatrix}_{3\times3}$$

$$A^T = \begin{bmatrix} 0 & -a & -b \\ a & 0 & c \\ b & -c & 0 \end{bmatrix}$$

$$A^T = -A$$

Note:

(I) $A^T = -A$

(II) Elements of opp side of P.D Must be Negative of Each other

$\because a_{ij} = -a_{ji} \quad \forall\, i \neq j$

(III) $a_{ii} = 0$

↳ Elements of P.D Must be Equal to ZERO.

at The P.D $(i=j)$

$a_{ii} = -a_{ii} \Rightarrow 2a_{ii} = 0$

Question

The matrix $\begin{bmatrix} 0 & 5 & -7 \\ -5 & 0 & 11 \\ 7 & -11 & 0 \end{bmatrix}$ is

A a skew-symmetric matrix

B a symmetric matrix

C a diagonal matrix

D an upper triangular matrix

Question – CBSE 2024 PYQs

If $A = \begin{bmatrix} a & c & -1 \\ b & 0 & 5 \\ 1 & -5 & 0 \end{bmatrix}$ is a skew-symmetric matrix, then the value of 2a-(b+c) is:

A. 0

B. 1

C. -10

D. 10

$a = 0$

$b = -c$

$\Rightarrow 2(0) - (b - c)$

$\Rightarrow 0$

QUESTION- 7 [1 MARKS]

Q. If $A = \begin{bmatrix} 0 & 1 & c \\ -1 & a & -b \\ 2 & 3 & 0 \end{bmatrix}$ is a skew-symmetric matrix then the value of $a + b + c =$

A 1

B 2

C 3

D 4

$a = 0$

$c = -2$

$-b = -3$

$b = 3$

$a+b+c$

$\Rightarrow 0 - 2 + 3$

$\Rightarrow 1$



IMP. THEOREM

→ For a square matrix $(A+A^T)$ is symmetric matrix.

PROOF

$$(A+A^T)^T = A^T + (A^T)^T \quad \left\{\begin{matrix}(A+B)^T = A^T+B^T \\ (A^T)^T = A\end{matrix}\right\}$$

$$\Rightarrow A^T + A$$

$$(A+A^T)^T = (A+A^T)$$

$A+A^T$ is Symm

Symm

$$(\text{VIRAT})^T = \text{VIRAT}$$

→ VIRAT : Symm

$$(\text{MODI})^T = \text{MODI}$$

→ MODI : Symm

$$(\text{SSR})^T = \text{SSR}$$

SSR : Symm

→ For a square matrix $(A-A^T)$ is skew - symmetric matrix.

Proof

$$(A-A^T)^T = A^T - (A^T)^T$$

$$\Rightarrow A^T - A$$

$$\Rightarrow -(A-A^T)$$

$$(A-A^T)^T = -(A-A^T)$$

$A-A^T$ is skew

Skew'

$$(SSR)^T = -SSR$$

SSR : Skew

$$(VIRAT)^T = -VIRAT$$

VIRAT : Skew

Question: CUET 2026 PYQs

For any square matrix A, $(A - A^T)$ is always

A. A null matrix

B. A symmetric matrix

C. A skew-symmetric matrix

D. An identity matrix

→ *A square matrix can be represented as the* ***sum of Symmetric and skew symmetric matrix***

$$A = \frac{1}{2}\left[\underbrace{(A+A^T)}_{\hookrightarrow \text{SYMM}} + \underbrace{(A-A^T)}_{\hookrightarrow \text{SKEW}}\right]$$

A ↓ SQUARE

NOTE:

(I) $\because (A+A^T)$ is symm

$\rightarrow (A+A^T)$ is Also symm

(II) $\because (A-A^T)$ is SKEW

$\rightarrow (A-A^T)$ is Also SKEW

Question: CUET 2026 PYQs

Let A be the matrix $\begin{bmatrix} 3 & -4 \\ 1 & -1 \end{bmatrix}$. If A is expressed as the sum of P and Q, where P is a symmetric and Q is a skew symmetric matrix, then which of the following options define P and Q correctly ?

A. $P = \begin{bmatrix} 3 & -\frac{3}{2} \\ -\frac{3}{2} & -1 \end{bmatrix}, Q = \begin{bmatrix} 0 & -\frac{5}{2} \\ \frac{5}{2} & 0 \end{bmatrix}$

B. $P = \begin{bmatrix} 2 & -\frac{3}{2} \\ -\frac{3}{2} & -2 \end{bmatrix}, Q = \begin{bmatrix} 1 & -\frac{5}{2} \\ \frac{5}{2} & 1 \end{bmatrix}$

C. $P = \begin{bmatrix} 3 & -\frac{5}{2} \\ -\frac{3}{2} & -1 \end{bmatrix}, Q = \begin{bmatrix} 0 & -\frac{3}{2} \\ \frac{5}{2} & 0 \end{bmatrix}$

D. $P = \begin{bmatrix} 3 & -\frac{3}{2} \\ -\frac{3}{2} & -1 \end{bmatrix}, Q = \begin{bmatrix} 2 & -\frac{5}{2} \\ -\frac{5}{2} & 1 \end{bmatrix}$

$$A = \frac{1}{2}\left[(A+A^T)+(A-A^T)\right] = P+Q$$

$$\frac{1}{2}(A+A^T) + \frac{1}{2}(A-A^T) = P+Q$$

$$P = \frac{1}{2}(A+A^T)$$

$$Q = \frac{1}{2}(A-A^T)$$

$$\because A = \begin{bmatrix} 3 & -4 \\ 1 & -1 \end{bmatrix}$$

$$A^T = \begin{bmatrix} 3 & 1 \\ -4 & -1 \end{bmatrix}$$

$$(A+A^T) = \begin{bmatrix} 6 & -3 \\ -3 & -2 \end{bmatrix}$$

$$P = \frac{1}{2}(A+A^T) = \begin{bmatrix} 3 & -3/2 \\ -3/2 & -1 \end{bmatrix}$$

Question: CUET 2026 PYQs

If a matrix $A = \begin{bmatrix} 3 & -5 & 7 \\ 5 & 2 & 4 \\ -7 & -4 & 9 \end{bmatrix}$ is expressed as the sum of a symmetric matrix P and a skew symmetric matrix Q, then symmetric matrix P will be

A. $2A$

B. zero matrix

C. a diagonal matrix

D. $\frac{1}{2}(A - A^T)$

$$A = \frac{1}{2}\left[(A+A^T)+(A-A^T)\right]$$

$$A \Rightarrow \underbrace{\frac{1}{2}(A+A^T)}_{P} + \underbrace{\frac{1}{2}(A-A^T)}_{Q}$$

$$P = \frac{1}{2}(A+A^T)$$

$$A = \begin{bmatrix} 3 & -5 & 7 \\ 5 & 2 & 4 \\ -7 & -4 & 9 \end{bmatrix}$$

$$A^T = \begin{bmatrix} 3 & 5 & -7 \\ -5 & 2 & -4 \\ -7 & 4 & 9 \end{bmatrix}$$

$$(A+A^T) = \begin{bmatrix} 6 & 0 & 0 \\ 0 & 4 & 0 \\ 0 & 0 & 18 \end{bmatrix}$$

$$\frac{1}{2}(A+A^T) = \begin{bmatrix} 3 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 9 \end{bmatrix}$$

→ **If A is a symmetric matrix then A^n will be also symmetric matrix**

(NEN

Sol^n $(A^n)^T = (A^T)^n$ { Given A is Symm $A^T = A$ }

$(A^n)^T = A^n$

A^n is Symm

→ If A is a square matrix which is symmetric and skew symmetric both, it will be null matrix

Proof

$\because$ A is Symm $\Leftrightarrow A^T = A$ — (1)

& A is Skew Symm $\Leftrightarrow A^T = -A$ — (2)

$$A = -A$$

$$2A = 0$$

$$\boxed{A = 0}$$

A is Null Matrix

Question: CUET 2026 PYQs

A matrix which is both symmetric and skew symmetric is a

A. Matrix with odd integral powers

B. Identity matrix

C. Matrix with even integral powers

D. Null matrix

Question – CUET 2025 PYQs

The matrix $\begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$ is a

(A) Null matrix

(B) Unit matrix

(C) Symmetric matrix

(D) Skew-symmetric matrix

Choose the correct answer from the options given below:

A (A), (C) and (D) only

B (A), (B) and (C) only

C (A), (B) and (D) only

D (C) and (D) only

CUET Most Expected Questions & PYQs

Question: CUET 2026 PYQs

Let $A = [a_{ij}]_{3\times 3}$, where $a_{ij} = i - j$, then which of the following statements is/are TRUE ?

$$A = \begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix}$$

A. A is diagonal matrix ✗

B. A is square matrix

C. A is symmetric matrix ✗

D. A is skew symmetric matrix

$$A = \begin{bmatrix} 0 & -1 & -2 \\ 1 & 0 & -1 \\ 2 & 1 & 0 \end{bmatrix}_{3\times 3}$$

Choose the correct answer from the options given below:

a) A and B only

b) B and D only

c) B and C only

d) A and C only

Question: CUET 2026 PYQs

Which of the following statements are TRUE?

A. If the product of two matrices is a zero matrix, it is not necessary that one of the matrix is a zero matrix. ✓

B. For any three matrices A, B and C, $(AB)C = A(CB)$. ✗

C. Diagonal elements of a skew symmetric matrix can be non-zero. ✗

D. Multiplication of diagonal matrices of same order is always commutative. ✓

Choose the correct answer from the options given below:

$$\begin{bmatrix} a & 0 & 0 \\ 0 & b & 0 \\ 0 & 0 & c \end{bmatrix}\begin{bmatrix} m & 0 & 0 \\ 0 & n & 0 \\ 0 & 0 & p \end{bmatrix} = \begin{bmatrix} am & 0 & 0 \\ & & \end{bmatrix}$$

a) B and C only

b) B, C and D only

c) A and D only

d) A, B and C only

Question: CUET 2026 PYQs

Which of the following are correct?

A. $A = \begin{bmatrix} -9 & 4 & -3 \\ -1 & 0 & 4 \\ 2 & 2 & 0 \end{bmatrix}$; $a_{22} + a_{32} = -9$ where a_{ij} denotes the $(i_j)^{th}$ element of matrix A.

B. $A = \begin{bmatrix} 2 & -2 \\ -2 & 2 \end{bmatrix}$; $A^2 = pA$, then $p = 4$

C. $\begin{bmatrix} 8 & 6 \\ 6 & 16 \end{bmatrix}$ is a symmetric matrix

D. $\begin{bmatrix} 0 & -5 & 3 \\ 5 & 0 & -7 \\ -3 & 7 & 0 \end{bmatrix}$ is a symmetric matrix

Choose the correct answer from the options given below:

a) (A) and (D) only

b) (A) and (B) only

c) (B) and (C) only

d) (B) and (D) only

Question: CUET 2026 PYQs

Which of the following statements are correct ?

A. If $A = \begin{bmatrix} 1 & 4 \\ 3 & 7 \end{bmatrix}$, then $A - A^T$ is skew-symmetric matrix.

B. If A and B are square matrices of equal order and B is symmetric, then $A^T BA$ is symmetric.

C. If A is a square matrix, then $A^T A$ is symmetric.

D. Every element of the principal diagonal of a symmetric matrix is zero.

Choose the correct answer from the options given below:

a) (A), (B), and (C) only

b) (A), (C), and (D) only

c) (B), (C), and (D) only

d) (A), (B), (C), and (D)

Question: CUET 2026 PYQs

If $A = \begin{bmatrix} 0 & 1 & -2 \\ -1 & 0 & 3 \\ x & -3 & 0 \end{bmatrix}$ is a skew symmetric matrix, then, the value of x is

A. 1

B. 2

C. -2

D. -1

Question: CUET 2026 PYQs

If the matrix $\begin{bmatrix} 5 & x^2 \\ 3x-2 & x-1 \end{bmatrix}$ is symmetric, then values of x are :

A. 1 and 5

B. 2 and 0

C. 1 and 2

D. 2 and 3

$x^2 = 3x-2$

$x^2 - 3x + 2 = 0$

$x^2 - 2x - x + 2 = 0$

$(x-2)(x-1) = 0$

$x = 2$

$x = 1$

Question: CUET 2026 PYQs

If $A = \begin{bmatrix} 0 & x & 3 \\ 2 & y & -1 \\ z & 1 & 0 \end{bmatrix}$ is a skew-symmetric matrix, then the value of $3x + y - 2z$ is

A. 1

B. 3

C. 0

D. -6

$x = -2$

$z = -3$

$y = 0$

$3(-2) - 2(-3)$

$\Rightarrow -6 + 6$

$\Rightarrow 0$

Question: CUET 2026 PYQs

If A and B are two symmetric matrices of the same order, then

A. $AB + BA$ is a skew symmetric matrix ✗

B. $AB - BA$ is a symmetric matrix ✗

C. $AB - BA$ is a skew symmetric matrix

D. $A + B$ is a skew symmetric matrix

$A^T = A$, $B^T = B$ Given

(A) $(AB+BA)^T = (AB)^T + (BA)^T$

$\Rightarrow B^T A^T + A^T B^T$

$\Rightarrow B A + A B$

$\Rightarrow (AB+BA)$

$AB+BA$ → Symm

(B) $(AB-BA)^T = (AB)^T - (BA)^T$

$\Rightarrow B^T A^T - A^T B^T$

$\Rightarrow BA - AB$

$\Rightarrow -(AB-BA)$

$AB-BA$: Skew

Question: CUET 2026 PYQs

If the matrix $\begin{bmatrix} 0 & \alpha & 2 \\ 2 & \beta & 1 \\ \gamma & -1 & 0 \end{bmatrix}$ is skew-symmetric, then $(\beta - \alpha - \gamma)$ equals

A. 1

B. 9

C. 4

D. 2

$\alpha = -2$

-2

$\beta = 0$

$\alpha = -2$

$\gamma = -2$

$-(-2)-(-2)$

$\Rightarrow 2+2$

$\Rightarrow 4$

Question: CUET 2026 PYQs

If A is a skew symmetric matrix ,then A^2 is a

A. skew symmetric matrix

B. symmetric matrix

C. zero matrix

D. Identity matrix

$A^T = -A$

$(A^2)^T = (A^T)^2$

$\Rightarrow (-A)^2$

$(A^2)^T \Rightarrow A^2$

A^2 : symm

Question: CUET 2026 PYQs

If matrix $A = \begin{bmatrix} 0 & 3a & -4 \\ 2 & 1 & 2 \\ 2b & 2 & -1 \end{bmatrix}$ is a symmetric matrix, then the values of a and b are

A. $a = -2, b = \frac{1}{3}$

B. $a = \frac{4}{3}, b = -1$

C. $a = \frac{2}{3}, b = -2$

D. $a = 1, b = 3$

$3a = 2$

$a = 2/3$

$2b = -4$

$b = -2$

Question: CUET 2026 PYQs

If A and B are symmertic matrics of the same order then which of th following statements are correct? $(A^T = A,\ B^T = B)$

A. AB is symmetric matrix ✗

B. AB -BA is skew symmetric matrix

C. B^TAB is symmetric matrix

D. $A - A^T$ is skew symmetric matrix

Choose the correct answer from the options given below:

a) ~~A~~ and C only

b) B and D only

c) ~~A~~, C and D only

d) B, C and D only

(A) $(AB)^T = B^T A^T$

$(AB)^T \Rightarrow B \cdot A$

(B) $(AB - BA)^T = (AB)^T - (BA)^T$

$\Rightarrow B^T \cdot A^T - A^T \cdot B^T$

$\Rightarrow B \cdot A - A \cdot B$

$\Rightarrow -(AB - BA)$

$(A - A^T)^T = A^T - (A^T)^T$

$\Rightarrow A^T - A$

$\Rightarrow -(A - A^T)$

(C) $(B^T A B)^T = B^T \cdot A^T \cdot (B^T)^T$

$\Rightarrow B^T A^T B$

$\Rightarrow B^T A B$

Question: CUET 2026 PYQs

If A is a skew-symmetric matrix then, the matrix B^TAB is:-

a) Symmetric matrix

b) Zero matrix

c) Identity matrix

d) Skew-symmetric matrix

$A^T = -A$

$(B^T \cdot A \cdot B)^T = B^T \cdot A^T \cdot (B^T)^T$

$\Rightarrow B^T \cdot A^T \cdot B$

$\Rightarrow B^T \cdot (-A) \cdot B$

$\Rightarrow -B^T \cdot A \cdot B$

Question: CUET 2026 PYQs

If $P = \begin{bmatrix} 5+x & 3 & a \\ b & x+y & c \\ d & e & y+z \end{bmatrix}$ is a skew symmetric matrix, then which of the following are TRUE ?

$b = -3$

$a = -d$

$e = -c$

$5 + x = 0 \Rightarrow x = -5$

$x + y = 0 \Rightarrow y = -x$

$y = 5$

$y + z = 0 \Rightarrow z = -y$

$z = -5$

A. $x + y + z = 5$ ✗

B. $x + y + z = -5$

C. $a + d + e + c = 0$

D. $z = 3$ ✗

Choose the correct answer from the options given below:

a) (A) and (C) only

b) (B) and (C) only

c) (B), (C) and (D) only

d) (C) and (D) only

Question: CUET 2026 PYQs

If the matrix $\begin{bmatrix} z & x-y+2 & x+4y-3 \\ x+y & 0 & a-3 \\ 2x-y+3 & a-1 & 0 \end{bmatrix}$ is skew-symmetric, then the value of $(a+x+y+z)$ is:

a) 4

b) 1

c) 2

d) 0

$2+0=2$

$a-1=-(a-3)$

$a-1=-a+3$

$2a=4$

$a=2$

$(x-y+2)=-(x+y)$

$2x+2=0$

$x=-1$

$z=0$

$(x+4y-3)=-(2x-y+3)$

$3x+3y=0$

$x+y=0$

Question: CUET 2026 PYQs

If P and Q are symmetric matrices of the same order, then $(PQ^T - QP^T)$ is :

A. Unit matrix

B. Symmetric matrix

C. Null matrix

D. Skew symmetric matrix

$$(PQ^T - QP^T)^T = (PQ^T)^T - (QP^T)^T$$

$$\Rightarrow (Q^T)^T \cdot P^T - (P^T)^T \cdot Q^T$$

$$\Rightarrow Q \cdot P^T - P \cdot Q^T$$

$$(PQ^T - QP^T)^T = -(PQ^T - QP^T)$$

Question – CUET 2025 PYQs

Which of the following statement is/are correct?

(A) A square matrix $A = [a_{ij}]$ is called a symmetric matrix if $a_{ij} = a_{ji}$ for all i, j

(B) $A = [a_{ij}]_{m \times m}$ is a diagonal matrix if $a_{ij} = 0$ when $i = j$

(C) A square matrix $A = [a_{ij}]$ is called a skew symmetric matrix, if $a_{ij} = -a_{ji}$ for all i, j

(D) The multiplication of diagonal matrices of same order is commutative

Choose the correct answer from the options given below:

A (A), (B) and (C) only

B (B), (C) and (D) only

C (A), (C) and (D) only

D (C) and (D) only

Question – CUET 2025 PYQs

Which of the following statement are correct?

(A) $A = [a_{ij}]_{n\times n}$ is a diagonal matrix if $a_{ij} = 0$ when $i = j$

(B) A square matrix $A = [a_{ij}]$ is called a symmetric matrix if $a_{ij} = a_{ji}$ for all i, j

(C) A square matrix $A = [a_{ij}]$ is called a skew-symmetric matrix if $a_{ij} = -a_{ji}$ for all i, j

(D) For every square matrix A , there exist an identity matrix of the same order such that $IA = AI = I$

Choose the correct answer from the options given below:

A (A), (B) and (C) only

B (B), (C) and (D) only

C (A) and (C) only

D (B) and (C) only

Question – CUET 2025 PYQs

If $A = [a_{ij}]_{3\times 2}$, where $a_{ij} = i + j$, then

(A) A is a square matrix ✗

(B) $a_{21} + a_{32} = 8$

(C) Number of elements in A is 6

$a_{21} = 2+1 = 3$

$a_{32} = 3+2 = 5$ ⟩ 8

(D) Transpose of $A = \begin{bmatrix} 2 & 3 \\ 3 & 4 \\ 4 & 5 \end{bmatrix}$ ✗ (3×2)

Choose the correct answer from the options given below:

A (A) and (B) only

B (B) and (C) only

C (C) and (D) only

D (A) and (D) only

Question – CUET 2025 PYQs

If $A = \begin{bmatrix} 2 & -3 & 4 \\ -3 & 5 & x \\ 4 & 3 & 0 \end{bmatrix}$ is a symmetric matrix and $B = \begin{bmatrix} 0 & 2 & -10 \\ -2 & z & 6 \\ y & -6 & 0 \end{bmatrix}$ is a skew-symmetric matrix, then the value of $(xy + yz + zx)$, is

A 0

B 30

C -30

D 60



Quick Summary

- Matrices → Order & Degree
- IMP Notes:
- Types of Matrices
- Row
- Column
- Rectangular $m \neq n$
- Square $m = n$
- Diagonal
- Scaler
- Identity
- Triangular → Upper and Lower
- Zero or Null

- Algebra of Matrices
- Equality
- Addition
- Multiplication
- Multiplication by a scaler
- How to take common from a matrix

By- SSR Sir



Quick Summary

- IMP Notes
- Integral Power of square matrix

- Transpose of a matrix
- Properties of transpose

- Symmetric matrix

- Skew Symmetric Matrix

- Properties of Symmetric & Skew Symmetric Matrix

By- SSR Sir



Home Work

- Complete NCERT Chapter 3
- Complete BPPT 6.0 = CUET 2027
- Mock Test



By- SSR Sir



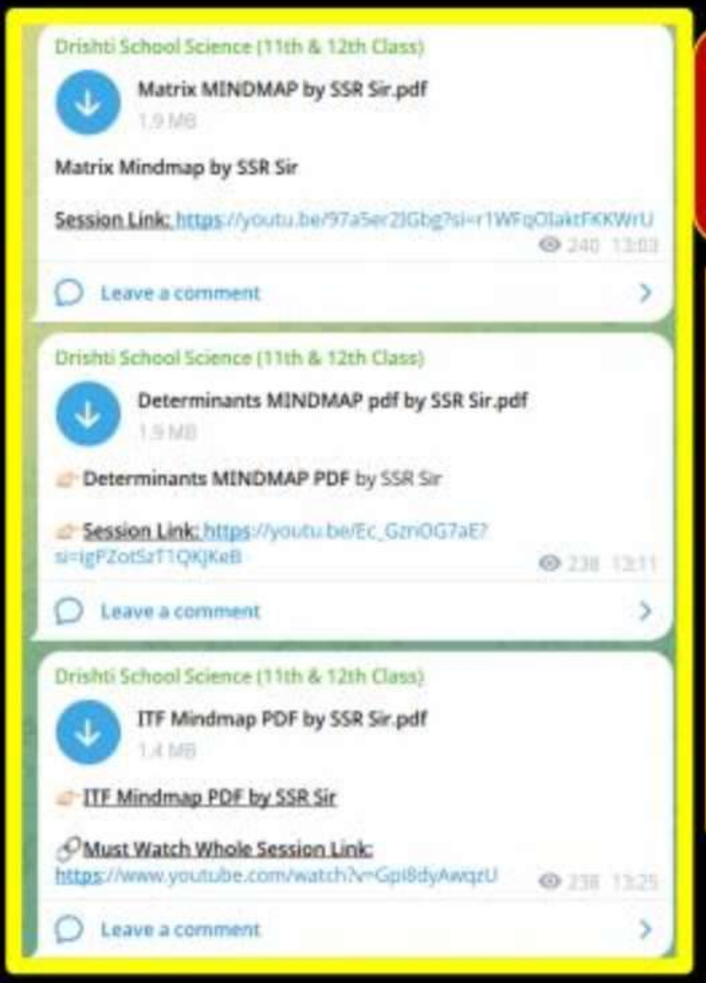
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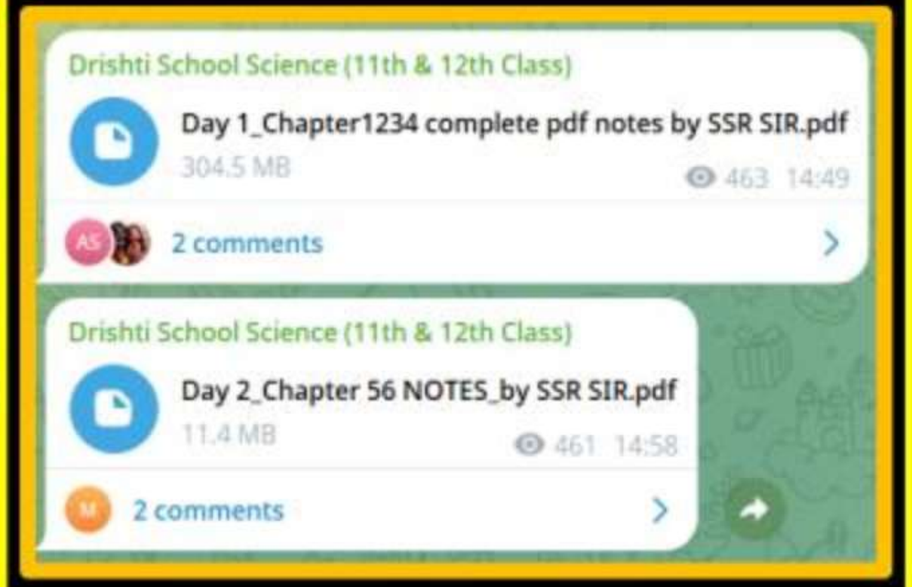


By- SSR Sir

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Thank You
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~ SHASHANK SINGH RAJPUT (SSR)