

BOARD EXAM QUESTIONS

Class: XII F

Sub: Mathematics

Ch. Matrices

One mark Questions

1. Write a square matrix of order 2, which is both symmetric and skew symmetric.

2. Find the value of x if $\begin{bmatrix} x+y & 4 \\ -5 & 3y \end{bmatrix} = \begin{bmatrix} 3 & 4 \\ -5 & 6 \end{bmatrix}$

3. Find the value of x if $\begin{pmatrix} 1 & 3 \\ 4 & 5 \end{pmatrix} \begin{pmatrix} x \\ 2 \end{pmatrix} = \begin{pmatrix} 5 \\ 6 \end{pmatrix}$

4. If $\begin{bmatrix} x+3 & 4 \\ y-4 & x+y \end{bmatrix} = \begin{bmatrix} 5 & 4 \\ 3 & 9 \end{bmatrix}$ find x and y.

5. Construct a 2 x 2 matrix whose element $a_{ij} = i + 2j$.

6. Find x and y if $2 \begin{bmatrix} 1 & 3 \\ 0 & x \end{bmatrix} + \begin{bmatrix} y & 0 \\ 1 & 2 \end{bmatrix} = \begin{bmatrix} 5 & 6 \\ 1 & 8 \end{bmatrix}$

7. If $A = \begin{bmatrix} 1 & 2 & 3 \end{bmatrix}$, write AA' .

8. If $\begin{bmatrix} 3x+y & -y \\ 2y-x & 3 \end{bmatrix} = \begin{bmatrix} 1 & 2 \\ -5 & 3 \end{bmatrix}$ find x & y.

9. If $\begin{bmatrix} x-y & 2 \\ x & 5 \end{bmatrix} = \begin{bmatrix} 2 & 2 \\ 3 & 5 \end{bmatrix}$ find y.

10. Find the value of x if $\begin{bmatrix} 2x-y & 5 \\ 3 & y \end{bmatrix} = \begin{bmatrix} 6 & 5 \\ 3 & -2 \end{bmatrix}$

11. If $\begin{bmatrix} y+2x & 5 \\ -x & 3 \end{bmatrix} = \begin{bmatrix} 7 & 5 \\ -2 & 3 \end{bmatrix}$ find value of y.

12. If $A = [a_{ij}] = \begin{pmatrix} 2 & 3 & -5 \\ 1 & 4 & 9 \\ 0 & 7 & -2 \end{pmatrix}$; $B = [b_{ij}] = \begin{pmatrix} 2 & 1 & -1 \\ -3 & 4 & 4 \\ 1 & 5 & 2 \end{pmatrix}$ find the value of $a_{22} + b_{21}$.

13. If $\begin{bmatrix} 3x-2y & 5 \\ x & -2 \end{bmatrix} = \begin{bmatrix} 3 & 5 \\ -3 & -2 \end{bmatrix}$ find the value of y.

14. If $\begin{bmatrix} 7y & 5 \\ 2x-3y & -3 \end{bmatrix} = \begin{bmatrix} -21 & 5 \\ 11 & -3 \end{bmatrix}$ find the value of x.

15. If $A = \begin{pmatrix} \cos \alpha & -\sin \alpha \\ \sin \alpha & \cos \alpha \end{pmatrix}$ then for what value of α is A an identity matrix?

16. If $\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} \begin{pmatrix} 3 & 1 \\ 2 & 5 \end{pmatrix} = \begin{pmatrix} 7 & 11 \\ k & 23 \end{pmatrix}$

17. Find the value of x if $\begin{pmatrix} 3 & 4 \\ 2 & x \end{pmatrix} \begin{pmatrix} x \\ 1 \end{pmatrix} = \begin{pmatrix} 19 \\ 15 \end{pmatrix}$

18. If $A = \begin{pmatrix} \cos \alpha & -\sin \alpha \\ \sin \alpha & \cos \alpha \end{pmatrix}$ then for what value of α is $A + A' = I$

19. Write the value of $x - y + z$ from the following equation: $\begin{bmatrix} x+y+z \\ x+z \\ y+z \end{bmatrix} = \begin{bmatrix} 9 \\ 5 \\ 7 \end{bmatrix}$

20. Write the order of the product matrix: $\begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix} [2 \ 3 \ 4]$.

21. Construct a 2 x 2 matrix $A = [a_{ij}]$ where : i) $a_{ij} = \frac{|3i + j|}{2}$ ii) $a_{ij} = \frac{(i - 2j)^2}{2}$

22. Find matrix X such that $B - 2A + X = O$, if $A = \begin{bmatrix} 5 & 3 \\ -3 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & -2 \\ 3 & 1 \end{bmatrix}$

23. i) If $A = \begin{bmatrix} a & 0 \\ 0 & a \end{bmatrix}$ find A^{16} ii) If $A = \begin{bmatrix} 0 & a \\ 0 & 0 \end{bmatrix}$ find A^{16}

24. Write two non – zero matrices A and B such that $AB = O$

4 marks/ 6 marks Questions

1. Using elementary transformations find the inverse of the following matrices:

i) $\begin{bmatrix} 0 & 1 & 2 \\ 1 & 2 & 3 \\ 3 & 1 & 1 \end{bmatrix}$ ii) $\begin{bmatrix} 1 & 2 & 3 \\ 2 & 5 & 7 \\ -2 & -4 & -5 \end{bmatrix}$ iii) $\begin{bmatrix} 2 & -1 & 4 \\ 4 & 0 & 2 \\ 3 & -2 & 7 \end{bmatrix}$ iv) $\begin{bmatrix} 3 & 0 & -1 \\ 2 & 3 & 0 \\ 0 & 4 & 1 \end{bmatrix}$ v) $\begin{bmatrix} 1 & 2 & -2 \\ -1 & 3 & 0 \\ 0 & -2 & 1 \end{bmatrix}$

vi) $\begin{bmatrix} 2 & 0 & -1 \\ 5 & 1 & 0 \\ 0 & 1 & 3 \end{bmatrix}$ vii) $\begin{bmatrix} 2 & 5 \\ 1 & 3 \end{bmatrix}$ viii) $\begin{bmatrix} 3 & 2 \\ 7 & 5 \end{bmatrix}$ ix) $\begin{bmatrix} 6 & 5 \\ 5 & 4 \end{bmatrix}$ x) $\begin{bmatrix} 3 & -1 \\ -4 & 1 \end{bmatrix}$

2. Express A as sum of a symmetric and a skew – symmetric matrix:

i) $A = \begin{bmatrix} 3 & 2 & 5 \\ 4 & 1 & 3 \\ 0 & 6 & 7 \end{bmatrix}$ ii) $A = \begin{bmatrix} 3 & -2 & -4 \\ 3 & -2 & -5 \\ -1 & 1 & 2 \end{bmatrix}$

3. If $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ verify that $A^2 - 4A - 5I = O$

4. If $A = \begin{bmatrix} 2 & 0 & 1 \\ 2 & 1 & 3 \\ 1 & -1 & 0 \end{bmatrix}$ then find the value of $A^2 - 3A + 2I$

5. If $A = \begin{bmatrix} 1 \\ -4 \\ 3 \end{bmatrix}$, $B = [-1 \ 2 \ 1]$ verify that $(AB)' = B'A'$