MATRICES & DETERMINANTS

Multiple Choice Questions(1 Mark)

¹ If order of matrix A is 2×3 and order of matrix B is 3×5 then order of matrix B'A' is : (a) 5×2 (b) 2×5 (c) 5×3 (d) 3×2 ² If $\begin{vmatrix} x & 1 \\ 1 & x \end{vmatrix} = \begin{vmatrix} 2 & 0 \\ 8 & 4 \end{vmatrix}$ then value of x is : (a)3 (b)2 ³ If $\begin{bmatrix} 2x + y & 0 \\ 5 & x \end{bmatrix} = \begin{bmatrix} 5 & 0 \\ 5 & 3 \end{bmatrix}$, then y is equal to:-(c)4 (d)8 (d)-1 (b)3 (c)2 4 If A + B = C where B and C are matrices of order 5×5 then order of A is :-(a) 5×5 (b) 5×3 (c) 3×5 (d) 3×3 If A B = C where B and C are matrices of order 2×5 and 5×5 respectively then order of A is :-5 (a) 5×5 (b) 5×2 (c) 2×5 (d) 2×2 6 If order of matrix A is 2×3 and order of matrix B is 3×5 then order of matrix AB is: (a) 5×2 (b) 2×5 (c) 5×3 (d) 3×2 ⁷ If order of matrix A is 4×3 and order of matrix B is 3×5 then order of matrix AB is : (b) 4×5 (a) 5×4 (c) 5×3 (d) 3×4 8 If A is a square matrix of order 4×4 and |A| = 3 then |Adj(A)| is (d)3 (a)27 (b)81 (c)9 If $A = \begin{bmatrix} 2 & 5 \\ 1 & -2 \end{bmatrix}$ then |A| is 9 (a)-9 (b)9 (d) - 1(c)1 10 If A is a matrix of order of 3×3 and |A| = 3 then |Adj(A)| is (a)81 (b)9 (d)3 (c)27 Fill-ups(1 Mark)

If $A = [a_{ij}]_{2 \times 3}$ such that $a_{ij} = i + j$ then $a_{11} =$ _____ 2) If |A| = 5 where A is a matrix of order 3×3 then |adj(A)| =_____ If matrix $A = \begin{bmatrix} 2 & 3 \\ 1 & 5 \end{bmatrix}$ then |A| =_____ 3) If order of matrix A is 3×4 then order of A' =_____ 4) If for a matrix , A' = A holds then A is _____ matrix. 5) If for a matrix , A' = -A holds then A is _____ matrix. 6) 7) If for any two matrices A and B, AB = BA = I then these matrices are ______ of each other. matrix is symmetric as well as skew-symmetric. 8) If order of matrix A is 3×4 and order of matrix B is 4×7 then order of AB is ______. 9)

If order of matrix A is 4×5 then number of elements in A are _____ 10)

2 Marks Questions

1. If
$$A = \begin{bmatrix} 2 & 3 \\ 4 & 5 \end{bmatrix}$$
, then verify $A^2 - 7A - 2I = 0$.
2. If $A = \begin{bmatrix} 3 & -5 \\ -4 & 2 \end{bmatrix}$ show that $A^2 - 5A - 14I = 0$.
3. If $A = \begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix}$ and $f(x) = x^2 - 4x + 1$ then find $f(A)$.

1)

4. If $A = \begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$ and $f(x) = x^2 - 2x - 3$ then find f(A). 5. If $A = \begin{bmatrix} 1 & 0 \\ -1 & 7 \end{bmatrix}$ and $A^2 - 8A = kI$ then find k. 6. If $A = \begin{bmatrix} 0 & 3 \\ -7 & 5 \end{bmatrix}$ then find k so that $kA^2 = 5A - 21I$. 7. Form a matrix $A = \begin{bmatrix} a_{ij} \end{bmatrix}$ of order 3×4 such that $a_{ij} = i^2 + j^2$. 8. Form a matrix $A = \begin{bmatrix} a_{ij} \end{bmatrix}$ of order 3×4 such that $a_{ij} = |2i - 3j|$. 9. If $X = \begin{bmatrix} 3 & 4 \\ 2 & -1 \end{bmatrix}$ and $2X - Y = \begin{bmatrix} 5 & 10 \\ 3 & -5 \end{bmatrix}$ then find the matrix Y. 10. If $X - 2Y = \begin{bmatrix} 3 & 4 \\ 2 & -1 \end{bmatrix}$ and $2X - Y = \begin{bmatrix} 5 & 10 \\ 3 & -5 \end{bmatrix}$ then find the matrices X and Y. 11. Verify (AB)' = B'A' for the following matrices : [1]

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

(iv)
$$A = \begin{bmatrix} 4 & -2 \\ -1 & 3 \end{bmatrix}$$
, $B = \begin{bmatrix} 2 & 7 \\ 5 & 0 \end{bmatrix}$

(v)
$$A = \begin{bmatrix} -1 & 3 & 0 \\ -7 & 2 & 8 \end{bmatrix}$$
, $B = \begin{bmatrix} -5 & 0 \\ 0 & 3 \\ 1 & -8 \end{bmatrix}$

(vi)
$$A = \begin{bmatrix} 2 & 1 & 3 \\ 4 & 1 & 0 \end{bmatrix}$$
, $B = \begin{bmatrix} 0 & 2 \\ 5 & 0 \end{bmatrix}$

12. Using determinants, show that following points are collinear :

(i)
$$(11, 7), (5, 5)$$
 and $(-1, 3)$

- (iii) (-2,5), (-6,-7) and (-5,-4)
- **13.** Find the value of x if (3, -2), (x, 2) and (8, 8) are collinear points.
- 14. Using determinants, find the value of k if the area of the triangle formed by the points (-3, 6), (-4, 4) and (k, -2) is 12 sq. units.
- 15. If the area of triangle is 35 sq. units with vertices (2, -6), (5, 4) and (k, 4) then find the value of k.
- 16. Find the equation of the line passing from (3, 2) and (-4, -7) using determinants.

6 Marks Questions

Solve the following system of linear equations by matrix method :

(i) x - y + 2z = 7, 3x + 4y - 5z = -5, 2x - y + 3z = 12

(ii)
$$x + y + z = 6$$
, $y + 3z = 11$, $x - 2y + z = 0$

- (iii) $3x + y + z = 10, \ 2x y z = 0, \ x y + 2z = 1$
- (iv) 2x + 3y + 3z = 5, x 2y + z = -4, 3x y 2z = 3
- (v) 2x + 3y + 3z = 5, x 2y + z = -4, 3x y 2z = 3
- (vi) x y + 2z = 2, 3x + 4y 5z = 2, 2x y + 3z = 4

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