

DPP

DAILY PRACTICE PROBLEMS

CLASS : XIIth
DATE :

SUBJECT : MATHS
DPP NO. : 1

Topic :-MATRICES

- If $A = [a_{ij}]_{m \times n}$ is a matrix of rank r and B is a square submatrix of order $r + 1$, then
 - B is invertible
 - B is not invertible
 - B may or may not be invertible
 - None of these
- If A is square matrix, A' , is its transpose, then $\frac{1}{2}(A - A')$ is
 - A symmetric matrix
 - A skew-symmetric matrix
 - A unit matrix
 - An elementary matrix
- Inverse of the matrix $A = \begin{bmatrix} 1 & -2 \\ 3 & 4 \end{bmatrix}$ is
 - $\frac{1}{10} \begin{bmatrix} 1 & -2 \\ 3 & 4 \end{bmatrix}$
 - $\frac{1}{10} \begin{bmatrix} 4 & 2 \\ -3 & 1 \end{bmatrix}$
 - $\begin{bmatrix} 4 & 2 \\ -3 & 1 \end{bmatrix}$
 - $\frac{1}{10} \begin{bmatrix} 4 & -2 \\ -3 & 1 \end{bmatrix}$
- Let A be a matrix of rank r . Then,
 - $\text{rank}(A^T) = r$
 - $\text{rank}(A^T) < r$
 - $\text{rank}(A^T) > r$
 - None of these
- The adjoint matrix of $\begin{bmatrix} 3 & -3 & 4 \\ 2 & -3 & 4 \\ 0 & -1 & 1 \end{bmatrix}$ is
 - $\begin{bmatrix} 4 & 8 & 3 \\ 2 & 1 & 6 \\ 0 & 2 & 1 \end{bmatrix}$
 - $\begin{bmatrix} 1 & -1 & 0 \\ -2 & 3 & -4 \\ -2 & 3 & -3 \end{bmatrix}$
 - $\begin{bmatrix} 11 & 9 & 3 \\ 1 & 2 & 8 \\ 6 & 9 & 1 \end{bmatrix}$
 - $\begin{bmatrix} 1 & -2 & 1 \\ -1 & 3 & 3 \\ -2 & 3 & -3 \end{bmatrix}$
- If a matrix A is such that $3A^3 + 2A^2 + 5A + I = 0$, then A^{-1} is equal to
 - $-(3A^2 + 2A + 5)$
 - $3A^2 + 2A + 5$
 - $3A^2 - 2A - 5$
 - None of these
- Let $A = [a_{ij}]_{n \times n}$ be a square matrix, and let c_{ij} be cofactor of a_{ij} in A . If $C = [c_{ij}]$, then
 - $|C| = |A|$
 - $|C| = |A|^{n-1}$
 - $|C| = |A|^{n-2}$
 - None of these
- The system of equations $x + y + z = 0$, $2x + 3y + z = 0$ and $x = 2y = 0$ has
 - A unique solution; $x = 0, y = 0, z = 0$
 - Infinite solutions
 - No solutions
 - Finite number of non-zero solutions
- If $2X - \begin{bmatrix} 1 & 2 \\ 7 & 4 \end{bmatrix} = \begin{bmatrix} 3 & 2 \\ 0 & -2 \end{bmatrix}$, then X is equal to
 - $\begin{bmatrix} 2 & 2 \\ 7 & 4 \end{bmatrix}$
 - $\begin{bmatrix} 1 & 2 \\ \frac{7}{2} & 2 \end{bmatrix}$
 - $\begin{bmatrix} 2 & 2 \\ \frac{7}{2} & 1 \end{bmatrix}$
 - None of these

10. Let $A = \begin{bmatrix} 1 & 2 \\ -5 & 1 \end{bmatrix}$ and $A^{-1} = xA + yI$, then the values of x and y are
 a) $x = -\frac{1}{11}, y = \frac{2}{11}$ b) $x = -\frac{1}{11}, y = -\frac{2}{11}$ c) $x = \frac{1}{11}, y = \frac{2}{11}$ d) $x = \frac{1}{11}, y = -\frac{2}{11}$
11. Let A and B be two symmetric matrices of same order. Then, the matrix $AB - BA$ is
 a) A symmetric matrix b) A skew-symmetric matrix
 c) A null matrix d) The identity matrix
12. If $A = \begin{bmatrix} 1 & x \\ x^2 & 4y \end{bmatrix}$, $B = \begin{bmatrix} -3 & 1 \\ 1 & 0 \end{bmatrix}$ and $\text{adj } A + B = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, then the values of x and y are respectively
 a) (1, 1) b) (-1, 1) c) (1, 0) d) None of these
13. Let p is a non-singular matrix such that $1 + p + p^2 + \dots + p^n = O$ (O denotes the null matrix), then p^{-1} is
 a) p^n b) $-p^n$ c) $-(1 + p + \dots + p^n)$ d) None of these
14. If $\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \frac{1}{40} \begin{bmatrix} 5 & 10 & -5 \\ -5 & -2 & 13 \\ 10 & -4 & 6 \end{bmatrix} \begin{bmatrix} 5 \\ 0 \\ 15 \end{bmatrix}$, then the value of $x + y + z$ is
 a) 3 b) 0 c) 2 d) 1
15. The matrix $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$ is the matrix reflection in the line
 a) $x = 1$ b) $x + y = 1$ c) $y = 1$ d) $x = y$
16. If $\begin{bmatrix} 1 & -\tan \theta \\ \tan \theta & 1 \end{bmatrix} \begin{bmatrix} 1 & \tan \theta \\ -\tan \theta & 1 \end{bmatrix}^{-1} = \begin{bmatrix} a & -b \\ b & a \end{bmatrix}$, then
 a) $a = 1, b = 1$ b) $a = \sin 2\theta, b = \cos 2\theta$
 c) $a = \cos 2\theta, b = \sin 2\theta$ d) None of the above
17. If $A = \begin{bmatrix} -1 & -2 & -2 \\ 2 & 1 & -2 \\ 2 & -2 & 1 \end{bmatrix}$, then $\text{adj } A$ is equal to
 a) A b) A' c) $3A$ d) $3A'$
18. Let the homogeneous system of linear equations $px + y + z = 0$, $x + qy + z = 0$, and $x + y + rz = 0$, where $p, q, r \neq 1$, have a non-zero solution, then the value of $\frac{1}{1-p} + \frac{1}{1-q} + \frac{1}{1-r}$ is
 a) -1 b) 0 c) 2 d) 1
19. If $A = \begin{bmatrix} 1 & \tan \frac{\theta}{2} \\ -\tan \frac{\theta}{2} & 1 \end{bmatrix}$ and $AB = I$, then B is equal to
 a) $\cos^2 \frac{\theta}{2} \cdot A$ b) $\cos^2 \frac{\theta}{2} \cdot A^T$ c) $\cos^2 \theta \cdot I$ d) $\sin^2 \frac{\theta}{2} \cdot A$
20. The values of x, y, z in order, if the system of equations $3x + y + 2z = 3$, $2x - 3y - z = -3$, $x + 2y + z = 4$ has unique solution, are
 a) 2, 1, 5 b) 1, 1, 1 c) 1, -2, -1 d) 1, 2, -1



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