All Branches Hinglish

Subject: Engineering Mathematics

DPP-01

Chapter: Linear Algebra

Topic : Types of Matrics & Operation on Matrices

1. Let A is a matrix of order 3 defined as, $A = [a_{ij}]_{3\times 3}$ where $a_{ij} = \lim\limits_{x\to\infty} \dfrac{\sin(ix)}{\tan(jx)}, \forall\, 1 \le i, j \le 3$. Then A^2 is

(a) 4A (b) 3A

(c) 2A (d) A

2. For α, β, γ, let $A = \begin{bmatrix} \alpha^2 & 6 & 8 \\ 3 & \beta^2 & 9 \\ 4 & 5 & \gamma^2 \end{bmatrix}$ & $B = \begin{bmatrix} 2\alpha & 3 & 5 \\ 2 & 2\beta & 6 \\ 1 & 4 & 2\gamma-3 \end{bmatrix}$. If $T_r(A) = T_r(B)$ then the value of $\left(\dfrac{1}{\alpha}+\dfrac{1}{\beta}+\dfrac{1}{\gamma}\right)$ is

(a) 1 (b) 2

(c) 3 (d) 4

3. If the product of n matrices $\begin{bmatrix}1 & 1\\ 0 & 1\end{bmatrix}\begin{bmatrix}1 & 2\\ 0 & 1\end{bmatrix}\begin{bmatrix}1 & 3\\ 0 & 1\end{bmatrix}\cdots\begin{bmatrix}1 & n\\ 0 & 1\end{bmatrix}$ is equal to the matrix $\begin{bmatrix}1 & 378\\ 0 & 1\end{bmatrix}$ then the value of n is equal to

(a) 26 (b) 27

(c) 377 (d) 378

4. If $A = \begin{bmatrix}1 & 2 & x\\ 0 & 1 & 0\\ 0 & 0 & 1\end{bmatrix}$ and $B = \begin{bmatrix}1 & -2 & y\\ 0 & 1 & 0\\ 0 & 0 & 1\end{bmatrix}$ and $AB = I_3$, then x + y equal

(a) 0 (b) –1

(c) 2 (d) –2

5. If $A = \begin{bmatrix}3 & 4\\ 1 & -6\end{bmatrix}$ and $B = \begin{bmatrix}-2 & 5\\ 6 & 1\end{bmatrix}$ then X such that $A + 2X = B$ equals

(a) $\begin{bmatrix}2 & 3\\ -1 & 0\end{bmatrix}$ (b) $\begin{bmatrix}3 & 5\\ -1 & 0\end{bmatrix}$

(c) $\begin{bmatrix}5 & 2\\ -1 & 0\end{bmatrix}$ (d) None of these

6. If $\begin{bmatrix}x & -5 & -1\end{bmatrix}\begin{bmatrix}1 & 0 & 2\\ 0 & 2 & 1\\ 2 & 0 & 3\end{bmatrix}\begin{bmatrix}x\\ 4\\ 1\end{bmatrix} = 0$, the x equals

(a) $\pm 2\sqrt{3}$ (b) $\pm 4\sqrt{3}$

(c) $\pm 3\sqrt{2}$ (d) $\pm 4\sqrt{2}$

7. Let $A + 2B = \begin{bmatrix}1 & 2 & 0\\ 6 & -3 & 3\\ -5 & 3 & 1\end{bmatrix}$ and $2A - B = \begin{bmatrix}2 & -1 & 5\\ 2 & -1 & 6\\ 0 & 1 & 2\end{bmatrix}$ then Tr(A) – Tr(B) has the value equal to

(a) 0 (b) 1

(c) 2 (d) 3

8. A is an involutary matrix given by $A = \begin{bmatrix}0 & 1 & -1\\ 4 & -3 & 4\\ 3 & -3 & 4\end{bmatrix}$ then the inverse of $\dfrac{A}{2}$ will be

(a) $2A$ (b) $\dfrac{A^{-1}}{2}$

(c) $\dfrac{A}{2}$ (d) A^2

9. Let $A = \begin{bmatrix} \beta & -1 \\ 1 & 2\beta \end{bmatrix}$ and $\det.(A^4) = 16$, then the product of all possible real value of β equals

(a) $\frac{1}{2}$ (b) $-\frac{1}{2}$

(c) 0 (d) 2

10. Let $a = 2$; $b = -4$; $c = 1$ and $d = -2$, then the matrix $\begin{bmatrix} a & b \\ c & d \end{bmatrix}$ is

(a) Idempotent (b) Involutary

(c) Non-singular (d) Nilpotent

Answer Key

1. (b)
2. (c)
3. (b)
4. (a)
5. (d)
6. (b)
7. (c)
8. (a)
9. (b)
10. (d)