# MATRICES MCQs

Q1. If A and B are square matrices of the same order, then $(A+B)(A-B)$ is equal to

(a) $A^2-B^2$ (b) $A^2-BA-AB-B^2$

(c) $A^2-B^2+BA-AB$ (d) $A^2-BA+B^2+AB$

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Q2 If $A=\begin{bmatrix} n & 0 & 0 \\ 0 & n & 0 \\ 0 & 0 & n \end{bmatrix}$ and $B=\begin{bmatrix} a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \\ c_1 & c_2 & c_3 \end{bmatrix}$, then AB

(a) B (b) nB (c) $B^n$ (d) $n^B$

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Q3 If A is a matrix of order $m \times n$ and B is a matrix such that $AB'$ and $B'A$ are both defined, then the order of matrix B is

(a) $m \times m$ (b) $n \times n$ (c) $n \times m$ (d) $m \times n$

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Q4 If $A=\begin{bmatrix} 1 & a \\ 0 & 1 \end{bmatrix}$, then $A^n$ is equal to

(a) $\begin{bmatrix} 1 & na \\ 0 & 1 \end{bmatrix}$ (b) $\begin{bmatrix} n & a \\ 0 & n \end{bmatrix}$ (c) $\begin{bmatrix} n & n \\ 0 & n \end{bmatrix}$ (d) $\begin{bmatrix} n & na \\ 0 & n \end{bmatrix}$

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Q5 $A=\begin{bmatrix} a & 0 & 0 \\ 0 & a & 0 \\ 0 & 0 & a \end{bmatrix}$, then $A^n$ is equal to

(a) $\begin{bmatrix} na & 0 & 0 \\ 0 & na & 0 \\ 0 & 0 & na \end{bmatrix}$ (b) $\begin{bmatrix} a^n & 0 & 0 \\ 0 & a^n & 0 \\ 0 & 0 & a^n \end{bmatrix}$ (c) $\begin{bmatrix} na^n & 0 & 0 \\ 0 & na^n & 0 \\ 0 & 0 & na^n \end{bmatrix}$ (d) I

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Q6 If $A=\begin{bmatrix} i & 0 \\ 0 & i \end{bmatrix}$, then $A^{4n}$ equal to

(a) $\begin{bmatrix} 0 & i \\ i & 0 \end{bmatrix}$ (b) $\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$ (c) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ (d) $\begin{bmatrix} 0 & i \\ i & 0 \end{bmatrix}$

Q7 If the matrix $AB$ is zero, then
(a) $A=0$ or $B=0$ (b) $A=0$ and $B=0$
(c) It's not necessary that either $A=0$ or $B=0$
(d) All the statements are wrong.

Q8 If $A=\begin{bmatrix}1 & 1 & 1\\ 1 & 1 & 1\\ 1 & 1 & 1\end{bmatrix}$, then $A^6$ is

(a) $A$ (b) $6A$ (c) $216A$ (d) $243A$

Q9 If $AB=B$ and $BA=A$, where $A$ and $B$ are square matrices, then
(a) $B^2=B$ & $A^2=A$ (b) $B^2=B$ or $A^2=A$
(c) $A^2\neq A$, $B^2=B$ (d) $A^2=A$, $B^2\neq B$

Q10 If $A$ and $B$ are two matrices such that $AB=B$ and $BA=A$, then $A^2+B^2$ is equal to
(a) $A+B$ (b) $2AB$ (c) $2BA$ (d) $AB+BA$

Q11 If the matrix $A$ is both symmetric and skew symmetric, then
(a) $A$ is diagonal matrix (b) $A$ is zero matrix
(c) $A$ is square matrix (d) None of these

Q12 If $\begin{bmatrix}a+b & 2\\ 5 & ab\end{bmatrix}=\begin{bmatrix}6 & 2\\ 5 & 8\end{bmatrix}$, then find $a$ and $b$

(a) 2, 4 (b) 4, 2 (c) Both (a) & (b) (d) None

Q13 If $AB=A$ and $BA=B$, then
(a) $B=I$ (b) $A=I$ (c) $A^2=A$ (d) $B^2=I$

Q14 Each diagonal element of a skew-symmetric matrix is

(a) Zero (b) positive (c) Negative (d) None

Q15 If $\begin{bmatrix} \cos\frac{2\pi}{7} & -\sin\frac{2\pi}{7} \\ \sin\frac{2\pi}{7} & \cos\frac{2\pi}{7} \end{bmatrix}^K = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}'$, then the least positive value of K is

(a) 3 (b) 4 (c) 6 (d) 7

Q16 If matrix $A = (a_{ij})_{2\times 2}$, where $a_{ij} = e^{2ix}\sin jx$, then the value of element $a_{12}$ is

(a) $e^x \sin x$ (b) $e^{2x}\sin x$ (c) $e^x \sin 2x$ (d) $e^{2x}\sin 2x$

Q17 If A & B are matrices of same order, then $(AB' - BA')$ is a

(a) Null matrix (b) Unit Matrix (c) Symmetric Matrix
(d) Skew symmetric matrix

Q18 If A and B are symmetric matrices of the same order, then

(a) AB is a symmetric matrix
(b) A-B is a skew Symmetric matrix
(c) AB + BA is a symmetric matrix
(d) AB - BA is a symmetric matrix

Q19 If $A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ a & b & -1 \end{bmatrix}$, then $(A-I)(A+I) = 0$ for

(a) a = b = 0 only (b) a = 0 only
(c) b = 0 only (d) any a and b

Q20 If $A^3 = 0$, then $A^2 + A + I =$

(a) $I - A$ (b) $(I - A)^{-1}$ (c) $(I + A)^{-1}$ (d) $I + A$

Q21 If $A = \begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$ and $f(x) = (1+x)(1-x)$, then $f(A)$ is

(a) $-4\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$ (b) $-8\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$ (c) $4\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$ (d) $\begin{bmatrix} -8^2 & -8^2 \\ -8^2 & -8^2 \end{bmatrix}$

Q22 If $A$ is a symmetric matrix and $n \in N$, then $A^n$ is a

(a) Symmetric matrix (b) diagonal matrix

(c) Skew-symmetric matrix (d) None