

Tarun Classes of Mathematics

IIT-JEE Mains | CBSE | PU-CET | NDA

Talwara Township, Hoshiarpur | +91 9463672753 | tarunclasses.in

Matrices And Determinants

Subjects : Maths

Previous Year Questions of NDA

Maths - Section A (MCQ.)

1. If P is a skew-symmetric matrix of order 3, then what is $\det(P)$ equal to?
A) -1 B) 0 C) 1 D) 3
2. Let A and B be two square matrices of same order. If AB is a null matrix, then which one of the following is correct?
A) Both A and B are null matrices
B) Either A or B is a null matrix
C) B is a null matrix if A is a non-singular matrix
D) Both A and B are singular matrices
3. What is the number of different matrices, each having 4 entries that can be formed using 1, 2, 3, 4 (repetition is allowed)?
A) 72 B) 216 C) 254 D) 768
4. Let A and B be matrices of order 3×3 . If $|A| = \frac{1}{2\sqrt{2}}$ and $|B| = \frac{1}{729}$, then what is the value of $|2B(\text{adj}(3A))|$?
A) 27 B) $\frac{27}{2\sqrt{2}}$ C) $\frac{27}{2}$ D) 1
5. If $A = \begin{bmatrix} 2 & 0 & 0 \\ 0 & 3 & 0 \\ 0 & 0 & 4 \end{bmatrix}$, then which of the following statements are correct?
 1. A^n will always be singular for any positive integer n .
 2. A^n will always be a diagonal matrix for any positive integer n .
 3. A^n will always be a symmetric matrix for any positive integer n .Select the correct answer using the code given below:
A) 1 and 2 only B) 2 and 3 only C) 1 and 3 only D) 1, 2 and 3
6. Let A be a matrix of order 3×3 and $|A| = 4$. If $|2\text{adj}(3A)| = 2^a 3^b$, then what is the value of $(\alpha + \beta)$?
A) 12 B) 13 C) 17 D) 24
7. If A, B and C are square matrices of order 3 and $\det(BC) = 2\det(A)$, then what is the value of $\det(2A^{-1}BC)$?
A) 16 B) 8 C) 4 D) 2

8. Consider the following statements in respect of a skew-symmetric matrix A of order 3:

1. All diagonal elements are zero.
2. The sum of all the diagonal elements of the matrix is zero.
3. A is orthogonal matrix.

Which of the statements given above are correct?

- A) 1 and 2 only B) 2 and 3 only C) 1 and 3 only D) 1, 2 and 3

9. Let X be a matrix of order 3×3 , Y be a matrix of order 2×3 and Z be a matrix of order 3×2 . Which of the following statements are correct?

- A. $(ZY)X$ is defined and is a square matrix of order 3.
- B. $Y(XZ)$ is defined and is a square matrix of order 2.
- C. $X(YZ)$ is not defined.

Select the answer using the code given below.

- A) A and B only B) B and C only C) A and C only D) A, B and C

10. Consider the following in respect of the matrices

$$P = \begin{bmatrix} 0 & c & -b \\ -c & 0 & a \\ b & -a & 0 \end{bmatrix} \text{ and } Q = \begin{bmatrix} a^2 & ab & ac \\ ab & b^2 & bc \\ ac & bc & c^2 \end{bmatrix}$$

- A. PQ is null a matrix.
- B. QP is an identity matrix of order 3.
- C. $PQ = QP$

which of the above is/are correct?

- A) A only B) B only C) A and C D) B and C

11. If $A = \begin{bmatrix} \sin 2\theta & 2\sin^2 \theta - 1 & 0 \\ \cos 2\theta & 2\sin \theta \cos \theta & 0 \\ 0 & 0 & 1 \end{bmatrix}$, then which of the following statements is/are correct?

1. $A^{-1} = \text{adj } A$
2. A is skew-symmetric matrix
3. $A^{-1} = A^T$

Select the correct answer using the code given below:

- A) 1 only B) 1 and 2 C) 1 and 3 D) 2 and 3

12. Consider the following statements in respect of two non-singular matrices A and B of the same order n :

1. $\text{adj}(AB) = (\text{adj } A)(\text{adj } B)$
2. $\text{adj}(AB) = \text{adj}(BA)$
3. $(AB)\text{adj}(AB) - |AB|I_n$ is a null matrix of order n

How many of the above statements are correct?

- A) None B) Only one statement C) Only two statements D) All three statements

13. Consider the following statements in respect of a non-singular matrix A of order n :

1. $A(\text{adj } A^T) = A(\text{adj } A)^T$
2. If $A^2 = A$, then A is identity matrix of order n
3. If $A^3 = A$, then A is identity matrix of order n

Which of the statements given above are correct?

- A) 1 and 2 only B) 2 and 3 only C) 1 and 3 only D) 1, 2 and 3

14. If $A = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$, then what is value of $\det(I + AA')$, where I is the 3×3 identity matrix?

- A) 15 B) 6 C) 0 D) -1

15. If $A = \begin{bmatrix} 2 & -1 & 0 \\ -1 & 3 & 0 \\ 1 & 0 & 1 \end{bmatrix}$, then what is the value of $\det[\text{adj}(\text{adj } A)]$?
- A) 5 B) 25 C) 125 D) 625
16. Consider the following statements in respect of square matrices A and B of same order:
1. If AB is a null matrix, then at least one of A and B is a null matrix.
 2. If AB is an identity matrix, then $BA = AB$.
- Which of the above statements is/are correct?
- A) 1 only B) 2 only C) Both 1 and 2 D) Neither 1 nor 2
17. For what value of n is determinant
- $$\begin{vmatrix} C(9, 4) & C(9, 3) & C(10, n-2) \\ C(11, 6) & C(11, 5) & C(12, n) \\ C(m, 7) & C(m, 6) & C(m+1, n+1) \end{vmatrix} = 0$$
- for every $m > n$?
- A) 4 B) 5 C) 6 D) 7
18. If $Z = \frac{1}{3} \begin{vmatrix} i & 2i & 1 \\ 2i & 3i & 2 \\ 3 & 1 & 3 \end{vmatrix} = x + iy; i = \sqrt{-1}$ then what is modulus of Z equal to?
- A) 1 B) $\sqrt{2}$ C) 2 D) $\sqrt{3}$
19. If $D_n = \begin{vmatrix} n & 20 & 30 \\ n^2 & 40 & 50 \\ n^3 & 60 & 70 \end{vmatrix}$ then what is the value of $\sum_{n=1}^4 D_n$?
- A) -10000 B) -10 C) 10 D) 10000
20. The system of linear equations $x + 2y + z = 4$, $2x + 4y + 2z = 8$ and $3x + 6y + 3z = 10$ has
- A) a unique solution B) infinite many solutions C) no solution D) exactly three solutions
21. Let $AX = B$ be a system of 3 linear equations with 3-unknowns. Let X_1 and X_2 be its two distinct solutions. If the combination $aX_1 + bX_2$ is a solution of $AX = B$; where a, b , are real numbers, then which one of the following is correct?
- A) $a = b$ B) $a + b = 1$ C) $a + b = 0$ D) $a - b = 1$
22. If a, b, c are in AP, then what is
- $$\begin{vmatrix} x+1 & x+2 & x+3 \\ x+2 & x+3 & x+4 \\ x+a & x+b & x+c \end{vmatrix}$$
- equal to?
- A) -1 B) 0 C) 1 D) 2
23. Let $f(x) = \begin{vmatrix} \cos x & x & 1 \\ 2 \sin x & x^2 & 2x \\ \tan x & x & 1 \end{vmatrix}$
- Paragraph:
Question:
What is $\lim_{x \rightarrow 0} \frac{f(x)}{x^2}$ equal to?
- A) -1 B) 0 C) 1 D) 2
24. The value of the determinant of a matrix A of order 3 is 3. If C is the matrix of cofactors of the matrix A , then what is the value of determinant of C^2 ?

A) 3

B) 9

C) 81

D) 729

25. If all elements of a third order determinant are equal to 1 or -1, then the value of the determinant is:

A) 0 only

B) an even number

C) an odd number

D) 0, 1 or -1

but not

necessarily 0

26.

If $(a-b)(b-c)(c-a) = 2$ and $abc = 6$, then what is the value of $\begin{vmatrix} a & b & c \\ a^2 & b^2 & c^2 \\ a^3 & b^3 & c^3 \end{vmatrix}$?

A) 3

B) 12

C) 14

D) 15

27.

Under which of the following conditions does the determinant $\begin{vmatrix} a & b & c \\ b & c & a \\ c & a & b \end{vmatrix}$ vanish?

1. $a + b + c = 0$ 2. $a^3 + b^3 + c^3 = 3abc$ 3. $a^2 + b^2 + c^2 - ab - bc - ca = 0$

Select the correct answer using the code given below :

A) 1 and 2 only

B) 2 and 3 only

C) 1 and 3 only

D) 1, 2 and 3

28. For what value of k is the matrix

$\begin{bmatrix} 2 \cos 2\theta & 2 \cos 2\theta & 6 \\ 1 - 2 \sin^2 \theta & 2 \cos^2 \theta - 1 & 3 \\ k & 2k & 1 \end{bmatrix}$ singular?

A) 0 only

B) 1 only

C) 2 only

D) Any real value

29. If $a + b + c = 4$ and $ab + bc + ca = 0$, then what is the value of the following determinant?

$\begin{vmatrix} a & b & c \\ b & c & a \\ c & a & b \end{vmatrix}$

A) 32

B) -64

C) -128

D) 64

30. If $A_k = \begin{bmatrix} k-1 & k \\ k-2 & k+1 \end{bmatrix}$, then what is

$\det(A_1) + \det(A_2) + \det(A_3) + \dots + \det(A_{100})$ equal to?

A) 100

B) 1000

C) 9900

D) 10000

Tarun Classes of Mathematics

IIT-JEE Mains | CBSE | PU-CET | NDA

Talwara Township, Hoshiarpur | +91 9463672753 | tarunclasses.in

Matrices And Determinants

Subjects : Maths

Previous Year Questions of NDA

Maths - Section A (MCQ.)

1 - B	2 - C	3 - D	4 - D	5 - B	6 - B	7 - A	8 - A	9 - D	10 - C
11 - C	12 - B	13 - D	14 - A	15 - D	16 - B	17 - C	18 - B	19 - A	20 - B
21 - B	22 - B	23 - A	24 - C	25 - B	26 - B	27 - D	28 - D	29 - B	30 - D

