

Chapter 4. MATRICES AND DETERMINANT

MATRICES PORTION

1) The order of the matrix $[4 \ 7 \ 3]$ is

- A) 3×1
- B) 1×3
- C) 3×3
- D) 1×1

Ans : B

2) The value of determinant of the matrix $\begin{bmatrix} 1 & 3 & 5 \\ 7 & 9 & 11 \\ 13 & 15 & 17 \end{bmatrix}$ is

- A) 0
- B) 1
- C) 2
- D) 3

Ans : A

3) $\begin{bmatrix} 4 & 0 \\ 0 & 1 \end{bmatrix}$ is a _____ matrix.

- A) singular
- B) unit
- C) diagonal
- D) scalar

Ans : C

4) If $\begin{bmatrix} 6 & \lambda \\ 3 & 2 \end{bmatrix}$ is singular matrix then $\lambda =$

- A) 4
- B) -4
- C) 12
- D) 18

Ans: A

5) A, B, C are three matrices such that $AB = C$ Then $B =$

- A) $C^{-1}A$
- B) CA
- C) $A^{-1}C$
- D) AC

Ans: C

6) If B is square matrix and $B^t = -B$, then B is called

- A) Symmetric
- B) Skew symmetric
- C) Singular
- D) Non-singular

Ans : B

7) For any two non singular square matrices A and B, $(AB)^{-1} =$

- A) AB
- B) $B^{-1}A^{-1}$
- C) $A^{-1}B^{-1}$
- D) $A^{-1}B$

Ans : B

8) If $A = \begin{bmatrix} 1 & 2 \\ 3 & -4 \end{bmatrix}$ and $B = \begin{bmatrix} 6 \\ 5 \end{bmatrix}$ then we can find

- A) $A + B$
- B) $A - B$
- C) AB
- D) BA

Ans: C

9) If A is non singular square matrix then $A^{-1} =$

- A) $\frac{1}{A}$
- B) $\frac{1}{|A|}$
- C) $\frac{adjA}{|A|}$
- D) $\frac{1}{adjA}$

Ans: C

10) If A is matrix of order $m \times n$ then kA is of order (k is real number)

- A) $km \times n$
- B) $m \times kn$
- C) $km \times kn$
- D) $m \times n$

Ans: D

11) If $B = \begin{bmatrix} 3 & 5 & 4 \\ 4 & 4 & 6 \\ 1 & 2 & 3 \end{bmatrix}$ then $-B$ is

A) $\begin{bmatrix} -3 & -5 & -4 \\ -4 & -4 & -6 \\ -1 & -2 & -3 \end{bmatrix}$

B) $\begin{bmatrix} -3 & 5 & 4 \\ -4 & 4 & 6 \\ -1 & 2 & 3 \end{bmatrix}$

C) $\begin{bmatrix} 3 & -5 & 4 \\ 4 & -4 & 6 \\ 1 & -2 & 3 \end{bmatrix}$

D) $\begin{bmatrix} 3 & 5 & -4 \\ 4 & 4 & -6 \\ 1 & 2 & -3 \end{bmatrix}$

Ans: A

12) If $A = \begin{bmatrix} 3 & 2 & 1 \\ 6 & 5 & 4 \\ 7 & 6 & 4 \end{bmatrix}$ then $2A$ is

A) $\begin{bmatrix} 6 & 4 & 2 \\ 6 & 5 & 4 \\ 7 & 6 & 4 \end{bmatrix}$

B) $\begin{bmatrix} 3 & 2 & 1 \\ 12 & 10 & 8 \\ 7 & 6 & 4 \end{bmatrix}$

C) $\begin{bmatrix} 3 & 2 & 1 \\ 6 & 5 & 4 \\ 14 & 12 & 8 \end{bmatrix}$

D) $\begin{bmatrix} 6 & 4 & 2 \\ 12 & 10 & 8 \\ 14 & 12 & 8 \end{bmatrix}$

Ans: D

13) For any three matrices A, B & C, conformable for multiplication, Reversal law for transpose of Product states that $(ABC)^t = \underline{\hspace{2cm}}$.

- A) $A^t B^t C^t$
- B) $C^t B^t A^t$
- C) $B^t A^t C^t$
- D) $C^t A^t B^t$

Answer: B

14) Transpose of a row matrix is called _____ matrix.

- A) row
- B) column
- C) square
- D) none of these

Answer: B

15) For any three matrices A, B & C, conformable for addition, $(A + B + C)^t = \underline{\hspace{2cm}}$.

- A) $C^t B^t A^t$
- B) $A^t + B^t + C^t$
- C) ABC
- D) $A + B + C$

Answer: B

16) For any matrix X, $(X^t)^t = \underline{\hspace{2cm}}$

- A) X
- B) X^t
- C) both A and B
- D) none of these

Answer: A

17) If the order of A and B are $m \times n$ and $p \times q$, the order of AB is.

- A) $m \times n$
- B) $p \times q$
- C) $m \times q$
- D) $m \times m$

Answer: C

18) If $B = \begin{bmatrix} -15 & 6 \\ 2 & 8 \\ 0 & 5 \end{bmatrix}$, then $B^2 = \underline{\hspace{2cm}}$.

A) $\begin{bmatrix} -5 & 4 \\ 23 & 6 \\ -2 & 3 \end{bmatrix}$

B) $\begin{bmatrix} 3 & 9 \\ 4 & 0 \\ 5 & 5 \end{bmatrix}$

- C) not possible
- D) none of these

Answer: C

19) The elements of a matrix can _____ the complex numbers or imaginary numbers.

- A) not be
- B) be
- C) sometime
- D) none of these

Answer: B

DETERMINANT PORTION

1) If all the elements of a row or column are zero, then its determinant is _____.

- A) 0
- B) 2
- C) 4
- D) none of these

Answer: A

2) According to the properties of determinants, a row can be _____ into another row.

- A) added
- B) subtracted
- C) both A & B
- D) none of these

Answer: C

3) A row or column of a determinant can be _____ by any scalar.

- A) multiplied
- B) added
- C) divided
- D) both A & C

Answer: D

4) If $A = \begin{bmatrix} 2 & 3 & -4 \\ 1 & -5 & 2 \\ 3 & 0 & -7 \end{bmatrix}$, then cofactor $A_{22} =$ _____.

- A) $\begin{vmatrix} 2 & -4 \\ 3 & -7 \end{vmatrix}$
- B) $\begin{vmatrix} 2 & 3 \\ 1 & -5 \end{vmatrix}$
- C) $\begin{vmatrix} -5 & 2 \\ 3 & -7 \end{vmatrix}$
- D) $\begin{vmatrix} 1 & -5 \\ 3 & 0 \end{vmatrix}$

Answer: A

5) If $A = \begin{bmatrix} 2 & 3 & -4 \\ 1 & -5 & 2 \\ 3 & 0 & -7 \end{bmatrix}$, then cofactor $A_{13} =$ _____.

- A) 27
- B) 15
- C) 90
- D) 32

Answer: B

6) Value of the determinant of matrix $\begin{bmatrix} a & 0 & b \\ c & 0 & -d \\ e & 0 & f \end{bmatrix}$ is

- A) 1
- B) 2
- C) 0
- D) 3

Answer: C

7) Value of determinant of the matrix $\begin{bmatrix} a & b+c & 1 \\ b & c+a & 1 \\ c & a+b & 1 \end{bmatrix}$ is

- A) c
- B) b
- C) a
- D) 0

Answer: D

8) $\begin{vmatrix} \sec a & 1 \\ 1 & \sec a \end{vmatrix} =$ _____

- A) $-\tan a$
- B) $\tan^2 a$
- C) $1 - \tan^2 a$
- D) None of these

Answer: B

9) The value of determinant of the matrix

$$\begin{bmatrix} 1 & \cos^2 \alpha & \sin^2 \alpha \\ 1 & \cos^2 \beta & \sin^2 \beta \\ 1 & \cos^2 \chi & \sin^2 \chi \end{bmatrix}$$
 is

- A) 1
- B) 0
- C) 2
- D) -1

Ans: B

10) The value of determinant of the matrix

$$\begin{bmatrix} \cos 2\alpha & \cos^2 \alpha & \sin^2 \alpha \\ \cos 2\beta & \cos^2 \beta & \sin^2 \beta \\ \cos 2\chi & \cos^2 \chi & \sin^2 \chi \end{bmatrix}$$
 is

- A) 1
- B) 2
- C) 0
- D) -1

Ans: C

11) The value of determinant of the matrix

$$\begin{bmatrix} a^2 - b^2 & b^2 - c^2 & a^2 - c^2 \\ b^2 - c^2 & c^2 - a^2 & b^2 - a^2 \\ c^2 - a^2 & a^2 - b^2 & c^2 - b^2 \end{bmatrix}$$
 is

- A) 0
- B) 1
- C) 2
- D) 3

Ans: A

12) If $B = \begin{bmatrix} 3 & 5 & 4 \\ 4 & 4 & 6 \\ 1 & 2 & 3 \end{bmatrix}$ then $-B$ is

A) $\begin{bmatrix} -3 & -5 & -4 \\ -4 & -4 & -6 \\ -1 & -2 & -3 \end{bmatrix}$

B) $\begin{bmatrix} -3 & 5 & 4 \\ -4 & 4 & 6 \\ -1 & 2 & 3 \end{bmatrix}$

C) $\begin{bmatrix} 3 & -5 & 4 \\ 4 & -4 & 6 \\ 1 & -2 & 3 \end{bmatrix}$

D) $\begin{bmatrix} 3 & 5 & -4 \\ 4 & 4 & -6 \\ 1 & 2 & -3 \end{bmatrix}$

Ans: A

13) If $A = \begin{bmatrix} 3 & 2 & 1 \\ 6 & 5 & 4 \\ 7 & 6 & 4 \end{bmatrix}$ then $2A$ is

A) $\begin{bmatrix} 6 & 4 & 2 \\ 6 & 5 & 4 \\ 7 & 6 & 4 \end{bmatrix}$

B) $\begin{bmatrix} 3 & 2 & 1 \\ 12 & 10 & 8 \\ 7 & 6 & 4 \end{bmatrix}$

C) $\begin{bmatrix} 3 & 2 & 1 \\ 6 & 5 & 4 \\ 14 & 12 & 8 \end{bmatrix}$

D) $\begin{bmatrix} 6 & 4 & 2 \\ 12 & 10 & 8 \\ 14 & 12 & 8 \end{bmatrix}$

Ans: D