MATRICES

1. If A and B are 2 rowed square matrices such that

$A + B = \begin{bmatrix} 4 & -3 \\ 1 & 6 \end{bmatrix}$ and $(A - B) = \begin{bmatrix} -2 & -1 \\ 5 & 2 \end{bmatrix}$ then AB = ?

(a) $\begin{bmatrix} -7 & 5 \\ 1 & -5 \end{bmatrix}$ (b) $\begin{bmatrix} 7 & -5 \\ 1 & 5 \end{bmatrix}$ (c) $\begin{bmatrix} 7 & -1 \\ 5 & -5 \end{bmatrix}$ (d) $\begin{bmatrix} 7 & -1 \\ -5 & 5 \end{bmatrix}$

2. If $\begin{bmatrix} 3 & -2 \\ 5 & 6 \end{bmatrix} + 2A = \begin{bmatrix} 5 & 6 \\ -7 & 10 \end{bmatrix}$ then A = ?

(a) $\begin{bmatrix} 1 & 3 \\ -5 & 4 \end{bmatrix}$ (b) $\begin{bmatrix} -1 & 5 \\ -3 & 4 \end{bmatrix}$ (c) $\begin{bmatrix} 1 & 4 \\ -6 & 2 \end{bmatrix}$ (d) none of these

3. If $A = \begin{bmatrix} 2 & 0 \\ -3 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 4 & -3 \\ -6 & 2 \end{bmatrix}$ are such that 4A +3X =5B then X = ?

(a) $\begin{bmatrix} 4 & -5 \\ -6 & 2 \end{bmatrix}$ (b) $\begin{bmatrix} 4 & 5 \\ -6 & -2 \end{bmatrix}$ (c) $\begin{bmatrix} -4 & 5 \\ 6 & -2 \end{bmatrix}$ (d) none of these

4 If $(A - 2B) = \begin{bmatrix} 1 & -2 \\ 3 & 0 \end{bmatrix}$ and $(2A - 3B) = \begin{bmatrix} -2 & 2 \\ 3 & -3 \end{bmatrix}$ then B = ?

(a) $\begin{bmatrix} 6 & -4 \\ -3 & 3 \end{bmatrix}$ (b) $\begin{bmatrix} -4 & 6 \\ -3 & -3 \end{bmatrix}$ (c) $\begin{bmatrix} 4 & -6 \\ 3 & -3 \end{bmatrix}$ (d) none of these

5. If $(2A - B) = \begin{bmatrix} 6 & -6 & 0 \\ -4 & 2 & 1 \end{bmatrix}$ and $(2B + A) = \begin{matrix} 3 & 2 & 5 \\ -2 & 1 & -7 \end{matrix}$ then A ?

(a) $\begin{bmatrix} -3 & 2 & 1 \\ 2 & 1 & -1 \end{bmatrix}$ (b) $\begin{bmatrix} 3 & 2 & -1 \\ 2 & -1 & 1 \end{bmatrix}$ (c) $\begin{bmatrix} 3 & -2 & 1 \\ -2 & 1 & -1 \end{bmatrix}$ (d) none of these

6. If $2\begin{bmatrix} 3 & 4 \\ 5 & x \end{bmatrix} + \begin{bmatrix} 1 & y \\ 0 & 1 \end{bmatrix} = \begin{bmatrix} 7 & 0 \\ 10 & 5 \end{bmatrix}$ then

(a) (x=-2, y=8) (b) (x=, y=-8) (c) (x=3,y=-6) (d) (x=-3,y=6)

7. If $\begin{bmatrix} x & -y & 2x & -y \\ 2x & +z & 3x & +w \end{bmatrix}$ - $\begin{bmatrix} -1 & 0 \\ 5 & 13 \end{bmatrix}$ then

(a) z=3, w=4 (b) z=4, w=3 (c) z=1, w=-2 (d) z=2, w=-1

8. If $\begin{bmatrix} x & y \\ 3y & x \end{bmatrix} - \begin{bmatrix} 1 \\ 2 \end{bmatrix} = \begin{bmatrix} 3 \\ 5 \end{bmatrix}$ then

(a)x=1,y=2 (b) x=2,y=1 (c) x= 1,y-1 (d) none of these

9. If the matrix A = $\begin{bmatrix} 3-2x & x+1 \\ 2 & 4 \end{bmatrix}$ is singular then x=?

(a)0 (b)1 (c)-1 (d)-2

10. If $A_\alpha = \begin{bmatrix} \cos\alpha & \sin\alpha \\ -\sin\alpha & \cos\alpha \end{bmatrix}$ then $(A_\alpha)^2$ =?

(a) $\begin{bmatrix} \cos^2\alpha & \sin^2\alpha \\ -\sin^2\alpha & \cos^2\alpha \end{bmatrix}$ (b) $\begin{bmatrix} \cos 2\alpha & \sin 2\alpha \\ -\sin 2\alpha & \cos 2\alpha \end{bmatrix}$

(c) $\begin{bmatrix} 2\cos\alpha & 2\sin\alpha \\ -\sin\alpha & 2\cos\alpha \end{bmatrix}$ (d) none of these

11. If A = $\begin{bmatrix} \cos\alpha & \sin\alpha \\ -\sin\alpha & \cos\alpha \end{bmatrix}$ be such that $A + A^{-1} = I$, then α = ?

(a) π (b) $\frac{\pi}{3}$ (c) π (d) $\frac{2\pi}{3}$

12. If A = $\begin{bmatrix} 1 & k & 3 \\ 3 & k & -2 \\ 2 & 3 & -4 \end{bmatrix}$ is singular then k =?

(a) $\frac{16}{3}$ (b) $\frac{34}{5}$ (c) $\frac{33}{2}$ (d) none of these

13. If A = $\begin{bmatrix} a & b \\ c & d \end{bmatrix}$ then adj A = ?

(a) $\begin{bmatrix} d & -c \\ -b & a \end{bmatrix}$ (b) $\begin{bmatrix} -d & b \\ c & -a \end{bmatrix}$ (c) $\begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$ (d) $\begin{bmatrix} -d & -b \\ c & a \end{bmatrix}$

14. If A = $\begin{bmatrix} 2x & 0 \\ x & x \end{bmatrix}$ and $A^{-1} = \begin{bmatrix} 1 & 0 \\ -1 & 2 \end{bmatrix}$ then x = ?

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

15. If A and B are square matrices of the same order then (A + B) (A- B) =?

(a) $(A^2 - B^2)$ (b) $A^2 + AB - BA - B^2$ (c) $A^2 - AB + BA - B^2$ (d) none of these

16. If A and B are square matrices of the same order then $(A + B)^2$ =?

(a) $A^2 + 2AB + B^2$ (b) $A^2 + AB + BA + B^2$ (c) $A^2 + 2BA + B^2$
(d) none of these

17. If A and B are square matrices of the same order then $(A - B)^2$= ?

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

(d) none of these

18. If A and B are symmetric matrices of the same order then (AB – BA) is always

(a) a symmetric matrix (b) a skew-symmetric matrix (c) a zero matrix

(d) an identity matrix

19. Matrices A and B are inverses of each other only when

(a) AB = BA (b) AB = BA = O (c) AB = O, BA =I (d) AB = BA = I

20. For square matrices A and B of the same order, we have adj (AB) = ?

(a) (adj A) (adj B) (b) (adj B) (adj A) (c) $|AB|$ (d) none of these

21. If A is a 3-rowed square matrix and $|A|$ = 4 then adj (adj A) = ?

(a) 4A (b) 16A (c) 64A (d) none of these

22. If A is a 3-rowed square matrix and $|A|$ = 5 then $|adjA|$ = ?

(a) 5 (b) 25 (c) 125 (d) none of these

23. For any two matrices A and B,

(a) AB = BA is always true (b) AB = BA is never true

(c) sometimes AB = BA and sometimes AB $\neq$ BA

(d) whenever AB exists, then BA exists

24. If A $\begin{bmatrix} 3 & 2 \\ 1 & -1 \end{bmatrix} = \begin{bmatrix} 4 & 1 \\ 2 & 3 \end{bmatrix}$ then A = ?

(a) $\begin{bmatrix} 1 & -1 \\ 1 & 1 \end{bmatrix}$ (b) $\begin{bmatrix} 1 & 1 \\ -1 & 1 \end{bmatrix}$ (c) $\begin{bmatrix} 1 & 1 \\ 1 & -1 \end{bmatrix}$ (d) none of these

25. If A is an invertible square matrix then $|A^{-1}| = ?$

(a) $|A|$ (b) $\frac{1}{|A|}$ (c) 1 (d) 0

26. If A and B are invertible matrices of the same order then(AB)$^{-1}$=?

(a) (A^1 x B^{-1}) (b) (A x B^{-1}) (c) (A^{-1} x B) (d) (B^{-1} x A^{-1})

27. If A and B are two nonzero square matrices of the same order such that AB =0then

(a) $|A| = 0$or$|B| = 0$ (b) $|A| = 0$ and $|B| = 0$ (c) $|A| \neq 0$ and $|B| \neq 0$ (d) none of these

28. If A is a square matrix such that $|A| \neq 0$ and A^2 – A + 2I = O then A^{-1} =?

(a) (I –A) (b) (I + A) (c) $\frac{1}{2}$(I –A) (d) $\frac{1}{2}$(I +A)

29. If A = $\begin{bmatrix} 1 & \lambda & 2 \\ 1 & 2 & 5 \\ 2 & 1 & 1 \end{bmatrix}$ is not invertible then λ =?

(a) 2 (b) 1 (c) -1 (d) 0

30. If A =$\begin{bmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{bmatrix}$then A^{-1}= ?

(a) A (b)-A (c) adjA (d)-adjA

33. If A is singular then A (ad) A) = ?

(a) a unit matrix (b) a null matrix (c) a symmetric matrix

(d) none of these

34. For any 2-rowed square matrix A, if A (adj A) = $\begin{bmatrix} 8 & 0 \\ 0 & 8 \end{bmatrix}$ then the value of $|A|$ is

(a) 0 (b) 8 (c) 64 (d) 4

35. If A = $\begin{bmatrix} -2 & 3 \\ 1 & 1 \end{bmatrix}$ then $\left|A^{-1}\right|$ = ?

(a) -5 (b) $\frac{-1}{5}$ (c) $\frac{1}{25}$ (d) 25

36. If A = $\begin{bmatrix} 3 & 1 \\ 7 & 5 \end{bmatrix}$ and $A^2 + xI = yA$ then the values of x and y are

(a) x = 6, y = 6 (b) x = 8, y= 8 (c) x = 5, y=8 (d) x =6, y = 8

37. If matrices A and B anti commutative then

(a) AB = BA (b) AB = -BA (c) $(AB) = (BA)^{-1}$ (d) none of these

38. If A = $\begin{bmatrix} 2 & 5 \\ 1 & 3 \end{bmatrix}$ then adj A = ?

(a) $\begin{bmatrix} 3 & -5 \\ -1 & 2 \end{bmatrix}$ (b) $\begin{bmatrix} 3 & -1 \\ -5 & 2 \end{bmatrix}$ (c) $\begin{bmatrix} -1 & 2 \\ 3 & -5 \end{bmatrix}$ (d) none of these

39. If A = $\begin{bmatrix} 3 & -4 \\ -1 & 2 \end{bmatrix}$ and B is a square matrix of order 2 such that AB = I then

B = ?

(a) $\begin{bmatrix} 1 & 2 \\ 2 & 3 \end{bmatrix}$ (b) $\begin{bmatrix} 1 & \frac{1}{2} \\ 2 & \frac{3}{2} \end{bmatrix}$ (c) $\begin{bmatrix} 1 & 2 \\ \frac{1}{2} & \frac{3}{2} \end{bmatrix}$ (d) none of these

40. If A and B are invertible square matrices of the same order then $(AB)^{-1}$= ?

(a) AB^{-1} (b) $A^{-1}B$ (c) $A^{-1}B^{-1}$ (d) $B^{-1}A^{-1}$

41. If A = $\begin{bmatrix} 2 & -1 \\ 1 & 3 \end{bmatrix}$, then A^{-1} = ?

(a) $\begin{bmatrix} \frac{3}{7} & \frac{-1}{7} \\ \frac{1}{7} & \frac{2}{7} \end{bmatrix}$ (b) $\begin{bmatrix} \frac{3}{7} & \frac{1}{7} \\ \frac{-1}{7} & \frac{2}{7} \end{bmatrix}$ (c) $\begin{bmatrix} \frac{1}{7} & \frac{1}{7} \\ \frac{1}{7} & \frac{2}{7} \end{bmatrix}$ (d) none of these

42. If $|A|$ = 3 and $A^{-1} = \begin{bmatrix} 3 & -1 \\ \frac{-5}{3} & \frac{2}{3} \end{bmatrix}$ then adj A = ?

(a) $\begin{bmatrix} 9 & 3 \\ -5 & -2 \end{bmatrix}$ (b) $\begin{bmatrix} 9 & -3 \\ -5 & 2 \end{bmatrix}$ (c) $\begin{bmatrix} -9 & 3 \\ 5 & -2 \end{bmatrix}$ (d) $\begin{bmatrix} 9 & -3 \\ 5 & -2 \end{bmatrix}$

43. If A is an invertible matrix and $A^{-1} = \begin{bmatrix} 3 & 4 \\ 5 & 6 \end{bmatrix}$ then A = ?

(a) $\begin{bmatrix} 6 & -4 \\ -5 & 3 \end{bmatrix}$ (b) $\begin{bmatrix} \frac{1}{3} & \frac{1}{4} \\ \frac{1}{5} & \frac{1}{6} \end{bmatrix}$ (c) $\begin{bmatrix} -3 & 2 \\ \frac{5}{2} & \frac{-3}{2} \end{bmatrix}$ (d) none of these

44. If A = $\begin{bmatrix} 1 & 2 \\ 4 & -3 \end{bmatrix}$ and $f(x) = 2x^2 - 4x + 5$ then f (A) = ?

(a) $\begin{bmatrix} 19 & -32 \\ -16 & 51 \end{bmatrix}$ (b) $\begin{bmatrix} 19 & -16 \\ -32 & 51 \end{bmatrix}$ (c) $\begin{bmatrix} 19 & -11 \\ -27 & 51 \end{bmatrix}$ (d) none of these

45. If A = $\begin{bmatrix} 1 & 4 \\ 2 & 3 \end{bmatrix}$ then $A^2 - 4A$=?

(a) 1 (b) 51 (c) 31 (d) 0

46. If A is a 2 rowed square matrix and $|A|$ = 6 then A-adj A =

(a) $\begin{bmatrix} 6 & 0 \\ 0 & 6 \end{bmatrix}$ (b) $\begin{bmatrix} 3 & 0 \\ 0 & 3 \end{bmatrix}$ (c) $\begin{bmatrix} \frac{1}{6} & 0 \\ 0 & \frac{1}{6} \end{bmatrix}$ (d) none of these

47. If A is an invertible square matrix and k is a non-negative real number

Then $(kA)^{-1}$ =?

(a) K . A^{-1} (b) $\left[\frac{1}{k}\right]$. A^{-1} (c) –k . A^{-1} (d) none of these

48. If A = $\begin{bmatrix} 3 & 4 & 1 \\ 1 & 0 & -2 \\ -2 & -1 & 2 \end{bmatrix}$ then A^{-1} =?

(a) $\begin{bmatrix} 2 & 9 & -8 \\ -2 & 8 & 7 \\ -1 & 5 & -4 \end{bmatrix}$ (b) $\begin{bmatrix} -2 & 9 & -8 \\ 2 & 8 & 7 \\ -1 & -5 & 4 \end{bmatrix}$

(c) $\begin{bmatrix} -2 & -9 & -8 \\ 2 & 8 & 7 \\ -1 & -5 & -4 \end{bmatrix}$ (d) none of these

49. If A is a square matrix then $(A + A^{\cdot)})$ is

(a) a null matrix (b) an identity matrix

(c) asymmetric matrix (d) a skew- symmetric matrix

50. If A is a square matrix then $(A - A^{\cdot})$ is

(a) a null matrix (b) an identity matrix

(c) a symmetric matrix (d) a skew-symmetric matrix

51. If A is a 3-rowed square matrix and $[3A[= k|A|$ then k=?

(a) 3 (b) 9 (c) 27 (d) 1

52. Which one of the following is a scalar matrix?

(a) $\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$ (b) $\begin{bmatrix} 6 & 0 \\ 0 & 3 \end{bmatrix}$ (c) $\begin{bmatrix} -8 & 0 \\ 0 & -8 \end{bmatrix}$ (d) none of these

53. If A = $\begin{bmatrix} 1 & -1 \\ 2 & -1 \end{bmatrix}$ and B- $\begin{bmatrix} a & 1 \\ b & -1 \end{bmatrix}$ and$(A + B)^2 = (A^2 + B^2)$ then

(a) a = 2, b = -3 (b) a = -2, b = 3 (c) a = 1, b = 4 (d) none of these

54. If A = $\begin{bmatrix} 2 & 1 \\ 3 & 4 \end{bmatrix}$, then (adj A) A =

(a) $\begin{bmatrix} \frac{1}{5} & 0 \\ 0 & \frac{1}{5} \end{bmatrix}$ (b) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ (c) $\begin{bmatrix} 5 & 0 \\ 0 & -5 \end{bmatrix}$ (d) $\begin{bmatrix} 5 & 0 \\ 0 & 5 \end{bmatrix}$

MATRIX: ANSWERS

1.	b	2.	c	3.	a	4.	b	5.	d	6.	d	
7.	b	8.	c	9.	c	10.	a	11.	a	12.	d	
13.	a	14.	d	15.	d	16.	b	17.	b	18.	d	
19.	a	20.	d	21.	b	22.	c	23.	c	24.	b	
25.	d	26.	a	27	c	28.	a	29.	b	30.	a	
31.	c	32.	c	33.	c	34.	b	35.	d	36.	B	
37.	a	38.	b	39.	a	40.	d	41.	c	42.	d	
43.	c	44.	b	45.	b	46.	c	47.	c	48.	c	
49.	a	50.	b	51.	b	52.	b	53.	d	54.	d	