MATHS

BOOKS - MARVEL MATHS (HINGLISH)

MATRICES

Multiple Choice Question

1. If AX=B, where $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}, B = \begin{bmatrix} 7 & 3 \\ 0 & 6 \end{bmatrix}$, then X=

A. $\begin{bmatrix} 1 & 0 \\ 2 & 3 \end{bmatrix}$

B. $\begin{bmatrix} 0 & 3 \\ 1 & 2 \end{bmatrix}$

C. $\begin{bmatrix} 3 & 2 \\ 0 & 1 \end{bmatrix}$

D. $\begin{bmatrix} 2 & 0 \\ 1 & 3 \end{bmatrix}$

Answer: D

Watch Video Solution

2. If AX=B, where $A = \begin{bmatrix} -1 & 2 \\ 2 & -1 \end{bmatrix}, B = \begin{bmatrix} 3 \\ 1 \end{bmatrix}$, then X=

A. $\begin{bmatrix} 3/5 \\ 3/7 \end{bmatrix}$

B. $\begin{bmatrix} 7/3 \\ 5/3 \end{bmatrix}$

C. $\begin{bmatrix} 5/3 \\ 7/3 \end{bmatrix}$

D. $\begin{bmatrix} 3/7 \\ 5/5 \end{bmatrix}$

Answer: C

Watch Video Solution

3. If $A \cdot \begin{bmatrix} 7 & 6 & -1 \\ 4 & 2 & 3 \\ 1 & 3 & 0 \end{bmatrix} = \begin{bmatrix} 4 & 2 & 3 \\ 1 & 3 & 0 \\ 7 & 6 & -1 \end{bmatrix}$, then A =

A. $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

B. $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & 0 & 1 \end{bmatrix}$

C. $\begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \end{bmatrix}$

D. $\begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0 & 0 & 1 \end{bmatrix}$

Answer: C

View Text Solution

4. If A is a square matrix, then what is adj $A^T - (adjA)^T$ equal to ?

A. $2|A|$

B. $2|adj.\ A|$

C. unit matrix

D. null matrix

Answer: B

Watch Video Solution

5. If A is a square matrix of order $n \times n$ then adj(adj A) is equal to

A. $|A|^{n-1} \cdot A$

B. $|A|^{n} \cdot A$

C. $|A|^{n-2} \cdot A$

D. $|A|A^{n}$

Answer: C

Watch Video Solution

6. If A is a non-singular matrix of order $n \times n,$ then : $|adj \cdot A| =$

A. $|A|^{n}$

B. $|A|^{n-1}$

C. $|A|^{n-2}$

D. $n|A|$

Answer: B

Watch Video Solution

7. If A is a non-singular matrix, then $A(adj.\ A) =$

A. identity matrix

B. null matrix

C. scalar matrix

D. diagonal matrix

Answer: C

Watch Video Solution

8. If A is a singular matrix, then A (adj A) is a

A. identity matrix

B. null matrix

C. scalar matrix

D. transpose of A

Answer: B

Watch Video Solution

9. If $A = \begin{bmatrix} 1 & 2 & -1 \\ -1 & 2 & 2 \\ 2 & -1 & 1 \end{bmatrix}$, then : $|adj(adj.\ A)| =$

A. $(17)^1$

B. $(17)^2$

C. $(17)^3$

D. $(17)^4$

Answer: B

Watch Video Solution

10. The sum of products of elements of any row with the cofactors of corresponging elements is equal to.....

A. $|A|$

B. $2|A|$

C. $\frac{1}{2}|A|$

D. 0

Answer: A

Watch Video Solution

11. If A and B are non-singular square matrices of same order then $adj(AB)$ is equal to

A. $(adj \cdot A)(adj \cdot B)$

B. $(adj \cdot B)(adj \cdot A)$

C. $(adj \cdot A) + (adj \cdot B)$

D. $(adj \cdot A) - (adj \cdot B)$

Answer: B

Watch Video Solution

12. If A is a square matrix of order $n \times n$ and k is a scalar, then $adj(kA)$ is equal to (1) $kadjA$ (2) $k^n adjA$ (3) $k^{n-1} adjA$ (4) $k^{n+1} adjA$

A. $k(adj.\ A)$

B. $k^n(adj.\ A)$

C. $k^{n-1}(adj.\ A)$

D. $k^{n+1}(adj.\ A)$

Answer: A

Watch Video Solution

13. If d is the determinant of a square matrix A of order n , then the determinant of its adjoint is d^n (b) d^{n-1} (c) d^{n+1} (d) d

A. d^n

B. d^{n-1}

C. d^{n-2}

D. d

Answer: B

Watch Video Solution

14. If A is non-singular matrix of order n such that $|A| = d$ and $|adj.\ A| = d'$, then :

A. $dd' = d^2$

B. $dd' = d^n$

C. $dd' = d^{n-1}$

D. $dd' = 1$

Answer: B

Watch Video Solution

15. For a invertible matrix A if $A(adjA) = \begin{bmatrix} 10 & 0 \\ 0 & 10 \end{bmatrix}$, then |A|=

A. 0

B. 10

C. 20

D. 100

Answer: B

Watch Video Solution

16. If A is a singular matrix, then adj A is

A. singular

B. non-singular

C. symmetrice

D. not defined

Answer: A

Watch Video Solution

17. If, in $D = \begin{bmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{bmatrix}$, the co-factor of a_r is A_r, then , $c_1A_1 + c_2A_2 + c_3A_3 =$

A. 0

B. $-|D|$

C. $|D|$

D. $|D|^2$

Answer: A

Watch Video Solution

18. If the value of a third order determinant is 11 then the value of the square of the determinant formed by the cofactors will be

A. 11

B. 121

C. 1331

D. 14641

Answer: B

Watch Video Solution

19. If $A = (a_{ij})$ is a 4×4 matrix and C_{ij}, is the co-factor of the element a_{ij}, in $Det(A)$, then the expression $a_{11}C_{11} + a_{12}C_{12} + a_{13}C_{13} + a_{14}C_{14}$

equals-

A. 0

B. -1

C. 1

D. Det(A)

Answer: D

Watch Video Solution

20. If $A = \begin{bmatrix} 4 & 2 \\ 3 & 4 \end{bmatrix}$, then: $|adj, A| =$

A. 6

B. 16

C. 10

D. -6

Answer: C

Watch Video Solution

21. If $A = \begin{bmatrix} a & 0 & 0 \\ 0 & a & 0 \\ 0 & 0 & a \end{bmatrix}$, then: $|A| \cdot |adj.\ A| =$

A. a^3

B. a^6

C. a^9

D. a^{27}

Answer: C

Watch Video Solution

22. If $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 2 \\ 1 & 2 & 2 \end{bmatrix}$, then

A. $C_{12} + C_{22} + C_{32} = 0$

B. $C_{13} + C_{23} + C_{33} = 1$

C. $C_{11} + C_{21} = C_{32}$

D. $C_{12} + C_{22} = C_{32}$

Answer: C

Watch Video Solution

23. If $A = \begin{bmatrix} -1/3 & -2/3 & -2/3 \\ 2/3 & 1/3 & -2/3 \\ 2/3 & -2/3 & 1/3 \end{bmatrix} = [a_{ij}]_{3\times 3}$, then, for all I and j ther co-factor C_{ij} of a_{ij} is such that

A. $C_{ij} = a_{ji}$

B. $C_{ij} = -a_{ji}$

C. $C_{ij} = a_{ij}$

D. $C_{ij} = (a_{ji})^2$

Answer: C

Watch Video Solution

24. If AX=I, where $A = \begin{bmatrix} 1 & 3 \\ 1 & 1 \end{bmatrix}$, then $X =$

A. $\begin{bmatrix} -1/2 & 3/2 \\ 1/2 & -1/2 \end{bmatrix}$

B. $\begin{bmatrix} -1/2 & -3/2 \\ -1/2 & -1/2 \end{bmatrix}$

C. $\begin{bmatrix} 1/2 & 3/2 \\ 1/2 & 1/2 \end{bmatrix}$

D. $\begin{bmatrix} 3 & 1 \\ 3 & 3 \end{bmatrix}$

Answer: A

Watch Video Solution

25. FindA, if $\begin{bmatrix} 4 \\ 1 \\ 3 \end{bmatrix} A = \begin{bmatrix} -4 & 8 & 4 \\ -1 & 2 & 1 \\ -3 & 6 & 3 \end{bmatrix}$

A. $\begin{bmatrix} 1 & 2 & -1 \end{bmatrix}$

B. $\begin{bmatrix} -1 & 2 & 1 \end{bmatrix}$

C. $\begin{bmatrix} 1 & -2 & 1 \end{bmatrix}$

D. $\begin{bmatrix} -1 & -2 & -1 \end{bmatrix}$

Answer: B

Watch Video Solution

26. If A is a square matrix such that $A^2 = I$, then A^{-1} is equal to

A. does not exist

B. I

C. $-A$

D. A

Answer: D

Watch Video Solution

27. If $A^2 + mA + nI = O$ and n $\neq 0, |A| \neq 0,$ then $A^{-1} =$

A. $-\frac{1}{m}(A + nI)$

B. $-\frac{1}{n}(A + mI)$

C. $-\frac{1}{m}(I + mA)$

D. $A + mnI$

Answer: B

Watch Video Solution

28. If $A^2 + 2A + 3I = O$ and $|A| \neq 0,$ then $A^{-1} =$

A. $-\frac{1}{3}(A + 2I)$

B. $-\frac{1}{2}(A + 3I)$

C. $-\frac{1}{5}(A + 6I)$

D. $A + 2I$

Answer: A

Watch Video Solution

29. If a 3×3 matrix A has its inverse equal to A, then $A^2 =$

A. $\begin{bmatrix} 0 & 1 & 0 \\ 1 & 1 & 1 \\ 0 & 1 & 0 \end{bmatrix}$

B. $\begin{bmatrix} 1 & 0 & 1 \\ 0 & 0 & 0 \\ 1 & 0 & 1 \end{bmatrix}$

C. $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

D. $\begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$

Answer: C

Watch Video Solution

30. If A and B be two non singular matrices and A^{-1} and B^{-1} are their respective inverse, then prove that $(AB)^{-1} = B^{-1}A^{-1}$.

A. AB

B. BA

C. $A^{-1}B^{-1}$

D. $B^{-1}A^{-1}$

Answer: D

Watch Video Solution

31. Statement 1: if $D = \text{diag}[d_1, d_2, , d_n]$,then $D^{-1} = \text{diag}\left[d_1^{-1}, d_2^{-1}, \ldots, d_n^{-1}\right]$ Statement 2: if $D = \text{diag}[d_1, d_2, , d_n]$,then $D^n = \text{diag}\left[d_1^n, d_2^n, \ldots, d_n^n\right]$

A. $\text{diag}[1/d_1, 1/d_2, \ldots, 1/d_n$

B. D

C. I

D. O

Answer: A

Watch Video Solution

32. If is a non-singular matrix, then det $\left(A^{1}\right) =$

A. $\det(A)$

B. $1/\det(A)$

C. 1

D. 0

Answer: B

Watch Video Solution

33. If $A^2 - A + I = O, \quad \text{then} \quad A^{-1} =$

A. A^2

B. A+I

C. A-I

D. I-A

Answer: D

View Text Solution

34. If A is a identity matrix of order 3, then its inverse $\left(A^{-1}\right)$

A. O

B. $3I_3$

C. I_3

D. does not exist

Answer: C

Watch Video Solution

35. If $AandB$ are two square matrices such that $B = -A^{-1}BA, then(A+B)^2$ is equal to A^2+B^2 b. O c. $A^2+2AB+B^2$ d. $A+B$

A. O

B. A^2+B^2

C. $A^2+2AB+B^2$

D. A+B

Answer: B

Watch Video Solution

36. The element in the first row and third column of the inverse of the matrix $\begin{bmatrix} 1 & 2 & -3 \\ 0 & 1 & 2 \\ 0 & 0 & 1 \end{bmatrix}$ is

A. -2

B. 0

C. 1

D. 7

Answer: D

Watch Video Solution

37. If $A = \begin{bmatrix} 2 & 2 \\ 1 & -2 \end{bmatrix}$, and $A^{-1} = \alpha A$, then $\alpha =$

A. 7

B. -7

C. $\frac{1}{7}$

D. $-\frac{1}{7}$

Answer: C

Watch Video Solution

38. If $A = \begin{bmatrix} 2 & 3 \\ 5 & -2 \end{bmatrix}$ then $I9A^{-1}$ is equal to (A) A' (B) 2A (C) $\frac{1}{2}A$ (D) A

A. A

B. 2A

C. $\frac{1}{2}A$

D. $-A$

Answer: A

Watch Video Solution

39. The inversej of the matrix $A = \begin{bmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ is

A. A

B. $-A$

C. $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

D. $\begin{bmatrix} 1 & 0 & 0 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{bmatrix}$

Answer: A

View Text Solution

40. If $A = [\alpha\beta\gamma - \alpha]$ is such that $A^2 = I$, then $1 + \alpha^2 + \beta\gamma = 0$ (b) $1 - \alpha^2 + \beta\gamma = 0$ (c) $1 - \alpha^2 - \beta\gamma = 0$ (d) $1 + \alpha^2 - \beta\gamma = 0$

A. $1 + \alpha^2 + \beta\gamma = 0$

B. $1 - \alpha^2 - \beta\gamma = 0$

C. $1 - \alpha^2 + \beta\gamma = 0$

D. $1 + \alpha^2 - \beta\gamma = 0$

Answer: B

Watch Video Solution

41. Which of the following matrices does not have inverse ?

A. $\begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$

B. $\begin{bmatrix} -1 & -1 \\ -1 & 2 \end{bmatrix}$

C. $\begin{bmatrix} 2 & 3 \\ 4 & 6 \end{bmatrix}$

D. $\begin{bmatrix} 2 & -2 \\ 1 & 1 \end{bmatrix}$

Answer: C

Watch Video Solution

42. If $A = \begin{bmatrix} 1 & 0 & -1 \\ 3 & 4 & 5 \\ 0 & 6 & 7 \end{bmatrix}$ and $A^{-1} = [\alpha_{ij}]_{3\times 3}$, then $\alpha_{23} =$

A. $\frac{21}{20}$

B. $\frac{1}{5}$

C. $-\frac{2}{5}$

D. $\frac{2}{5}$

Answer: D

Watch Video Solution

43. If $A^3 = I$ and $|A| \neq 0$, then $A^{-1} =$

A. $-A^3$

B. A^3

C. $-A^2$

D. A^2

Answer: D

View Text Solution

44. Inverse of the matrix $\begin{bmatrix} \cos\alpha & -\sin\alpha & 0 \\ \sin\alpha & \cos\alpha & 0 \\ 0 & 0 & 1 \end{bmatrix}$ is

A. $\begin{bmatrix} -\cos\alpha & \sin\alpha & 0 \\ \sin\alpha & \cos\alpha & 0 \\ 0 & 0 & 1 \end{bmatrix}$

B. $\begin{bmatrix} \cos\alpha & \sin\alpha & 0 \\ -\sin\alpha & \cos\alpha & 0 \\ 0 & 0 & 1 \end{bmatrix}$

C. $\begin{bmatrix} \cos\alpha & \sin\alpha & 0 \\ \sin\alpha & -\cos\alpha & 0 \\ 0 & 0 & 1 \end{bmatrix}$

D. $\begin{bmatrix} 0 & -1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

Answer: B

Watch Video Solution

45. Select and write the most appropriate answer from the given alternatives in each of the following :

If $A = \begin{pmatrix} 0 & 1 & 2 \\ 1 & 2 & 3 \\ 3 & a & 1 \end{pmatrix}$ and $A^{-1} = \frac{1}{2}\begin{pmatrix} 1 & -1 & 1 \\ -8 & 6 & 2c \\ 5 & -3 & 1 \end{pmatrix}$ then

A. $a = 2, c = -1/2$

B. $a = 1, c = -1$

C. $a = 1, c = 1$

D. $a = 1/2, c = 1/2$

Answer: B

Watch Video Solution

46. If x is a comples cube root of unity and $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & x & x^2 \\ 1 & x^2 & 1 \end{bmatrix}$, then $A^{-1} =$

A. $\frac{1}{4}\begin{bmatrix} 1 & x & x^2 \\ z^2 & 1 & x \\ x & x^2 & 1 \end{bmatrix}$

B. $\frac{1}{3}\begin{bmatrix} 1 & 1 & 1 \\ 1 & x^2 & x \\ 1 & x & x^2 \end{bmatrix}$

C. $\frac{1}{6}\begin{bmatrix} 1 & 1 & 1 \\ 1 & x^2 & x \\ 1 & x & x^2 \end{bmatrix}$

D. $\frac{1}{2}\begin{bmatrix}1 & 1 & 1\\ 1 & x^2 & x\\ 1 & x & x^2\end{bmatrix}$

Answer: B

View Text Solution

47. If $A = \begin{bmatrix}0 & 1 & 0\\ 1 & 0 & 0\\ 0 & 0 & 1\end{bmatrix}$, then $A^{-1} =$

A. A

B. $-A$

C. $\begin{bmatrix}1 & 0 & 0\\ 0 & 1 & 0\\ 0 & 0 & 1\end{bmatrix}$

D. $\begin{bmatrix}1 & 0 & 0\\ 1 & 0 & 0\\ 0 & 1 & 0\end{bmatrix}$

Answer: A

Watch Video Solution

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

A. $\begin{bmatrix} -2 & 2 & 1 \\ -3 & 2 & 2 \\ 4 & -3 & -2 \end{bmatrix}$

B. $\begin{bmatrix} -2 & -3 & 4 \\ 2 & 2 & -3 \\ 1 & 2 & -2 \end{bmatrix}$

C. $\begin{bmatrix} -2 & -2 & 1 \\ 2 & 1 & 2 \\ 2 & 0 & 1 \end{bmatrix}$

D. does not exist

Answer: B

Watch Video Solution

49. Let $A = \begin{bmatrix} 1 & -1 & 1 \\ 2 & 1 & -3 \\ 1 & 1 & 1 \end{bmatrix}$ and $10B = \begin{bmatrix} 4 & 2 & 2 \\ -5 & 0 & \alpha \\ 1 & -2 & 3 \end{bmatrix}$. If B is the inverse of A, then α is :

A. -2

B. -1

C. 2

D. 5

Answer: D

Watch Video Solution

50. If A is a 3×4 matrix and B is matrix such that $A^T B$ and BA^T are both define then order of B is :

A. 3×4

B. 3×3

C. 4×4

D. 4×3

Answer: A

Watch Video Solution

51. If $A = \begin{bmatrix} 2 & 1 \\ 3 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 2 \\ -1 & 3 \end{bmatrix}$, then $: A^{-1}B =$

A. $\begin{bmatrix} 3 & 1 \\ 5 & 0 \end{bmatrix}$

B. $\begin{bmatrix} 3 & 1 \\ -5 & 0 \end{bmatrix}$

C. $\begin{bmatrix} 3 & -1 \\ 5 & 0 \end{bmatrix}$

D. $\begin{bmatrix} 1 & 3 \\ 0 & -5 \end{bmatrix}$

Answer: B

Watch Video Solution

52. If

$A = \begin{bmatrix} 1+i & -i \\ i & 1+i \end{bmatrix}$, where $i = \sqrt{-1}$, and $A^2 - 2A + I = 0$, then

A. $\begin{bmatrix} 1-i & i \\ -i & 1-i \end{bmatrix}$

B. $\begin{bmatrix} 1-i & -i \\ i & 1+i \end{bmatrix}$

C. $\begin{bmatrix} 1+i & i \\ -i & 1-i \end{bmatrix}$

D. $\begin{bmatrix} 1+i & -i \\ i & 1-i \end{bmatrix}$\

Answer: A

Watch Video Solution

53. If $A = \begin{bmatrix} 3 & -3 & 4 \\ 2 & -3 & 4 \\ 0 & -1 & 1 \end{bmatrix}$, then show that $A^3 = A^{-1}$.

A. A

B. A^2

C. A^3

D. A^4

Answer: C

Watch Video Solution

54. Inverse of the matrix $\begin{bmatrix} 0.8 & 0.6 \\ 0.6 & 0.8 \end{bmatrix}$ is

A. $\begin{bmatrix} 0.8 & -0.6 \\ 0.6 & 0.8 \end{bmatrix}$

B. $\begin{bmatrix} -0.8 & 0.6 \\ -0.6 & 0.8 \end{bmatrix}$

C. $\begin{bmatrix} -0.8 & -0.6 \\ 0.6 & 0.8 \end{bmatrix}$

D. $\begin{bmatrix} 8 & -6 \\ 6 & 8 \end{bmatrix}$

Answer: A

Watch Video Solution

55. $F(x) = \begin{bmatrix} \cos x & -\sin x & 0 \\ \sin x & \cos x & 0 \\ 0 & 0 & 1 \end{bmatrix}$ and $G(x) = \begin{bmatrix} \cos x & 0 & \sin x \\ 0 & 1 & 0 \\ -\sin x & 0 & \cos x \end{bmatrix}$, then $[F(x)G(y)]^{-1}$ is equal to (A) $F(-x)G(-y)$ (B) $F(x-1)G(y-1)$ (C) $G(-y)F(-x)$ (D) $G\left(y^{-1}\right)F\left(x^{-1}\right)$

A. $f(-x) \cdot g(-y)$

B. $f\left(x^{-1}\right) \cdot g\left(y^{-1}\right)$

C. $g(-y) \cdot g(-x)$

D. $g\left(y^{-1}\right) \cdot f\left(x^{-1}\right)$

Answer: C

Watch Video Solution

56. If $A = \begin{bmatrix} 3 & 2 \\ 0 & 1 \end{bmatrix} then: \left(A^{-1}\right)^3 =$

A. $\frac{1}{27}\begin{bmatrix} 1 & -26 \\ 0 & 27 \end{bmatrix}$

B. $\frac{1}{27}\begin{bmatrix} 1 & 26 \\ 0 & 27 \end{bmatrix}$

C. $\frac{1}{27}\begin{bmatrix} 1 & -26 \\ 0 & -27 \end{bmatrix}$

D. $\frac{-1}{27}\begin{bmatrix} 1 & -26 \\ 0 & -27 \end{bmatrix}$

Answer: A

Watch Video Solution

57. The inverse of the matrix $\begin{bmatrix} 1 & 0 & 0 \\ a & 1 & 0 \\ b & c & 1 \end{bmatrix}$ is -

A. $\begin{bmatrix} 1 & 0 & 0 \\ -a & 0 & 0 \\ ac-b & -c & 1 \end{bmatrix}$

B. $\begin{bmatrix} 1 & 0 & 0 \\ -a & 0 & 0 \\ b & -c & 1 \end{bmatrix}$

C. $\begin{bmatrix} 1 & 0 & 0 \\ a & 0 & 0 \\ ac & b & 1 \end{bmatrix}$

D. $\begin{bmatrix} 1 & -a & ac-b \\ 0 & 1 & -c \\ 0 & 0 & 1 \end{bmatrix}$

Answer: A

Watch Video Solution

58. If $A = [a_{ij}]_{3\times 3}$, in which $a_{11} = 1, a_{12} = 2, a_{13} = 3$ and the corresponding co-factors are $A_{11} = 3, A_{12} = -2, A_{13} = 1$, then:det $(A) =$

A. -2

B. 0

C. 1

D. 2

Answer: D

Watch Video Solution

59. If a matrix $A = [a_{ij}]_{3\times 3}$ has first two rows identical, and $a_{31} = 1, a_{32} = 2, a_{31} = 3, A_{31} = 3, A_{33} = 1,$ then $A_{32} =$

A. -4

B. 2

C. -3

D. 6

Answer: C

Watch Video Solution

60. If A is 3×3 non-singular matrix such that $A^{-1} + (adj.\ A) = 0,$ then $\det\ (A) =$

A. 1

B. -1

C. 0

D. $1/2$

Answer: B

Watch Video Solution

61. If A and B are both 4×4 non-singular matrices such that $A + B = 0$ and $|A| = 2$, then $: B^{-1} =$

A. $\frac{1}{2}(adj.\ B)$

B. $-\frac{1}{2}(adj.\ B)$

C. $2(adj.\ B)$

D. $-2(adj.\ B)$

Answer: A

Watch Video Solution

62. If $x + y + z = 3, x + 2y + 3z, x + 4y + 9z = 6, \quad \text{then:} \quad (y, z) \equiv$

A. $(-1, 0)$

B. $(1, 0)$

C. $(1, -1)$

D. $(-1, 1)$

Answer: B

View Text Solution

63. If A is a 3×3 matrix such that det.A=0, then

A. A=0

B. A is non-singular

C. all elements of A are equal

D. A is singular

Answer: D

Watch Video Solution

64. If A is a 2×2 matrix such that

A. $A^{2008}+I$

B. $A^{2009}+I$

C. A+I

D. A

Answer: C

View Text Solution

65. If $A = \begin{bmatrix} a & b & c \\ b & c & a \\ c & a & b \end{bmatrix}$, $abc = 1$, $A^T A = l$, then find the value of $a^3 + b^3 + c^3$.

A. 1

B. 3

C. 4

D. none of these

Answer: C

Watch Video Solution

66. If $A = \begin{bmatrix} \alpha & 0 \\ 1 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 0 \\ 5 & 1 \end{bmatrix}$, then te value of α for which $A^2 = B$, is

A. 1

B. -1

C. 4

D. non real values

Answer: D

Watch Video Solution

67. if $A = \begin{bmatrix} \alpha & 2 \\ 2 & \alpha \end{bmatrix}$ and $\left|A^3\right| = 125$ then the value of $\alpha$is

A. ± 1

B. ± 2

C. ± 3

D. ± 5

Answer: C

Watch Video Solution

68. Let : $A = \begin{bmatrix} 0 & 0 & 1 \\ 0 & -1 & 0 \\ -1 & 0 & 0 \end{bmatrix}$.

Then the only correct sta

A. A is a zero matrix

B. $A = (-1)$I, where I is unit matrix

C. A^{-1}does not exist

D. $A^2 = 1$

Answer: D

Watch Video Solution

69. The system of equations

$\alpha x + y + z = \alpha - 1,$

$x + \alpha y + z = \alpha - 1$

$x + y + \alpha z = \alpha - 1$

and has no solution if α is

A. 1

B. not-2

C. either-2 or 1

D. -2

Answer: D

Watch Video Solution

70. If $A^2 - A + I = O, \quad \text{then} \quad A^{-1} =$

A. $I - A$

B. $A - I$

C. A

D. $A + I$

Answer: A

View Text Solution

71. Let $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ and $BA = \begin{bmatrix} a & 0 \\ 0 & b \end{bmatrix}, a, b \in N$ Then,

A. there exists more than one but finite number of B's such that AB=BA

B. there exists exactly one B such that AB=BA

C. there exist inifitely many B's such that AB=BA

D. there cannot exist any B such that AB=BA

Answer: C

Watch Video Solution

72. If A and B are square matrices of size $n \times n$ such that $A^2 - B^2 = (A - B)(A + B)$, then which of the following will be always true

A. AB=BA

B. ether of A or B is a zero matrix

C. either of A or B is an identity matrix

D. A=B

Answer: A

Watch Video Solution

73. If $\omega = 1$ is the complex cube root of unity and matrix $H = \begin{vmatrix} \omega & 0 \\ 0 & \omega \end{vmatrix}$, then H^{70} is equal to:

A. H

B. O

C. $-H$

D. H^2

Answer: A

Watch Video Solution

74. Let P and Q be 3×3 matrices with $P \neq Q$. If $P^3 = Q^3 and P^2Q = Q^2P$, then determinant of $\left(P^2 + Q^2\right)$ is equal to (1) 2 (2) 1 (3) 0 (4) 1

A. -2

B. 1

C. 0

D. -1

Answer: C

Watch Video Solution

75. If A is non-singular and $(A - 2I)(A - 4I) = O, then \frac{1}{6}A + \frac{4}{3}A^{-1}$ is equal to OI b. $2I$ c. $6I$ d. I

A. O

B. I

C. 2I

D. 6I

Answer: B

Watch Video Solution

76. If A and B are square matrices of the same order such that B = $-A^{-1}$ BA , then $(A+B)^2$:

A. A^2+B^2

B. O

C. A^2+2B+B^2

D. A+B

Answer: A

Watch Video Solution

77. If A and B are symmetric matrices of the same order such that C=AB+BA and D=AB-BA, then : $(CD)^T =$

A. CD

B. DC

C. $-DC$

D. none of these

Answer: C

Watch Video Solution

78. If : $f(x, y) = \begin{bmatrix} \cos x & \sin x & 0 \\ -\sin x & \cos x & 0 \\ 0 & 0 & e^y \end{bmatrix}$ then : $[f(x, -y)]^{-1} =$

A. $f(x, -y)$

B. f(-x,-y)

C. f(-x,y)

D. none of these

Answer: B

View Text Solution

79. Let K be a positive real number and

$$A = \begin{bmatrix} 2k-1 & 2\sqrt{k} & 2\sqrt{k} \\ 2\sqrt{k} & 1 & -2k \\ -2\sqrt{k} & 2k & -1 \end{bmatrix} \text{ and } \begin{bmatrix} 0 & 2k-1 & \sqrt{k} \\ 1-2k & 0 & 2 \\ -\sqrt{k} & -2\sqrt{k} & 0 \end{bmatrix}$$

If det (adjA)+det(adjB)=10^6 , then [k] is equal to

A. 3

B. 4

C. 5

D. 6

Answer: B

Watch Video Solution

80. If $A = \begin{bmatrix} 3 & 2 & 6 \\ 1 & 1 & 2 \\ 2 & 2 & 5 \end{bmatrix}, B = \begin{bmatrix} 1 & 2 & -2 \\ -1 & 2 & -2 \\ - & -2 & 1 \end{bmatrix}$, then

A. AB is not a scaler matrix

B. AB is not synmmetric

C. A and B are inverse of each other

D. AB is a singular matrix

Answer: C

View Text Solution

81. If $A = \begin{bmatrix} \cos\theta & -\sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$, and AB=BA=I" then "B=

A. $\begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$,

B. $\begin{bmatrix} \cos\theta & \sin\theta \\ \sin\theta & \cos\theta \end{bmatrix}$,

C. $\begin{bmatrix} \cos\theta & -\sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$,

D. $\begin{bmatrix} -\cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$,

Answer: A

Watch Video Solution

82. If C_{ij} is the co-factor of a_{ij} and $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 2 \\ 1 & 2 & 2 \end{bmatrix}$ then

A. $C_{12} + C_{22} + C_{32} = 0$

B. $C_{13} + C_{23} + C_{33} = 1$

C. $C_{11} + C_{21} = C_{32}$

D. $C_{11} + C_{22} + C_{33}$

Answer: C

View Text Solution

83. Let $A = \begin{bmatrix} \cos\theta & -\sin\theta \\ -\sin\theta & -\cos\theta \end{bmatrix}$ then inverse of A is

A. $\begin{bmatrix} \cos\theta & -\sin\theta \\ -\sin\theta & -\cos\theta \end{bmatrix}$

B. $\begin{bmatrix} -\cos\theta & \sin\theta \\ \sin\theta & \cos\theta \end{bmatrix}$

C. $\begin{bmatrix} \sin\theta & -\cos\theta \\ \cos\theta & -\sin\theta \end{bmatrix}$

D. $\begin{bmatrix} -\sin\theta & -\cos\theta \\ -\cos\theta & \sin\theta \end{bmatrix}$

Answer: A

Watch Video Solution

84. If matrix $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$, then $|A|^{-1}$ is equal to

A. ad-bc

B. $\frac{1}{ad-bc}$

C. $\frac{1}{ad-bc}\begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$

D. $|adj.\ (A)|$

Answer: B

Watch Video Solution

85. If $A^n = \begin{bmatrix} \cos n\theta & \sin n\theta \\ -\sin n\theta & \cos n\theta \end{bmatrix}$ then the matrix B satisfying AB=BA=I is

A. $\begin{bmatrix} \sin\theta & -\cos\theta \\ \cos\theta & \sin\theta \end{bmatrix}$

B. $\begin{bmatrix} \sin\theta & \cos\theta \\ -\cos\theta & \sin\theta \end{bmatrix}$

C. $\begin{bmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{bmatrix}$

D. $\begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$

Answer: C

Watch Video Solution

86. If $A\begin{bmatrix} 7 & 6 & -1 \\ 4 & 2 & 3 \\ 1 & 3 & 0 \end{bmatrix} = \begin{bmatrix} 4 & 2 & 3 \\ 1 & 2 & 0 \\ 7 & 6 & -1 \end{bmatrix}$ then A=

A. $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & 1 & 0 \end{bmatrix}$

B. $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

C. $\begin{bmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

D. $\begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \end{bmatrix}$

Answer: D

View Text Solution

Test Your Grasp

1. If $A = [a_{ij}]_{2\times 2}$ where $a_{ij} = 2i + j$, then : $A =$

A. $\begin{bmatrix} 3 & 4 \\ 5 & 6 \end{bmatrix}$

B. $\begin{bmatrix} 3 & 5 \\ 4 & 6 \end{bmatrix}$

C. $\begin{bmatrix} 3 & 5 \\ 5 & 6 \end{bmatrix}$

D. $\begin{bmatrix} 3 & 6 \\ 5 & 4 \end{bmatrix}$

Answer: B

Watch Video Solution

2. If $A+3B=\begin{bmatrix}1 & 2 & 3\\ -2 & 3 & 5\end{bmatrix}$ and $2A+3B=\begin{bmatrix}2 & -1 & 4\\ -1 & 5 & 2\end{bmatrix}$, then $A=$

A. $\begin{bmatrix}1 & 3 & 1\\ 1 & 2 & -3\end{bmatrix}$

B. $\begin{bmatrix}1 & -3 & 1\\ 1 & 2 & -3\end{bmatrix}$

C. $\begin{bmatrix}1 & -3 & 1\\ 1 & -2 & -3\end{bmatrix}$

D. $\begin{bmatrix}1 & -3 & 1\\ -1 & 2 & -3\end{bmatrix}$

Answer: B

Watch Video Solution

3. If A and B are square matrices of order 3 such that det(A)=-2 and det(B)=4, then : det(2AB)=

A. 64

B. 16

C. -16

D. -64

Answer:

Watch Video Solution

4. If A is a non-singularmatrix such that $A^2 - A + I = O$, then: $A^{-1} =$

A. A^{-2}

B. I-A

C. A-I

D. A+I

Answer:

Watch Video Solution

5. If $A = \begin{bmatrix} x & 1 \\ 1 & 0 \end{bmatrix}$ and $A = A^{-1}$, then x= ....

A. 1

B. 2

C. 0

D. 4

Answer:

Watch Video Solution

6. If $AC = A$ and $BA = B$, then: $A^2 =$

A. A

B. B

C. I

D. O

Answer:

Watch Video Solution

7. For a invertible matrix A if $A(adjA) = \begin{bmatrix} 10 & 0 \\ 0 & 10 \end{bmatrix}$, then |A|=

A. 20

B. 30

C. 10

D. 40

Answer:

Watch Video Solution

8. If A and B are square matrices of the same order such that $A^2 = A, B^2 = B$ and $(A+B)^2 = A+B,$ then $: AB =$

A. O

B. BA

C. I

D. $-BA$

Answer: A

Watch Video Solution

9. If $A = \begin{bmatrix} 2 & 3 \\ 1 & -1 \end{bmatrix}$ and $A^2 = A + B$, then : $B =$

A. $3I$

B. $4I$

C. $5I$

D. $6I$

Answer: C

Watch Video Solution

10. Solve system of linear equations, using matrix method,

$xy + 2z = 7$ $3x + 4y 5z = 5$

$2xy + 3 z = 12$

A. $(4, -1)$

B. $(-4, 1)$

C. (1,3)

D. $(-4, 2)$

Answer:

Watch Video Solution

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

A. A

B. $-A$

C. A^2

D. A^r

Answer:

Watch Video Solution

12. If $A = \begin{bmatrix} 4 & 2 \\ 5 & 3 \end{bmatrix}$ then $: |adj(adjA)| =$

A. 1

B. 2

C. 3

D. 4

Answer:

Watch Video Solution

13. If $A = \begin{bmatrix} 2 & -1 & 1 \\ 1 & 2 & 1 \\ -1 & 1 & 3 \end{bmatrix}$ then $|adj(adjA)| =$

A. $(17)^2$

B. $(17)^3$

C. $(17)^4$

D. $(17)^5$

Answer: C

Watch Video Solution

14. If $A = \begin{bmatrix} \sec x & \tan x \\ \tan x & \sec x \end{bmatrix}$ and $A(adj \cdot A) = k\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, then $: k =$

A. 0

B. 1

C. 2

D. 3

Answer:

Watch Video Solution

15. If $A = \begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix} = (\alpha I + \beta A)^2$ then α and β =

A. $a = b = \pm\sqrt{2}$

B. $a = b = \pm\dfrac{1}{\sqrt{2}}$

C. $a = b = \pm\dfrac{1}{\sqrt{3}}$

D. $a \neq b$

Answer:

Watch Video Solution

16. If $A = \begin{bmatrix} 2 & 1 \\ 3 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 2 \\ -1 & 3 \end{bmatrix}$, then: $B^{-1}A =$

A. $\begin{bmatrix} 3 & 1 \\ 5 & 0 \end{bmatrix}$

B. $\begin{bmatrix} 3 & 1 \\ -5 & 0 \end{bmatrix}$

C. $\begin{bmatrix} 3 & -1 \\ 5 & 0 \end{bmatrix}$

D. $\begin{bmatrix} 1 & 3 \\ 0 & -5 \end{bmatrix}$

Answer:

Watch Video Solution

17. If $A = \begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & 1 \\ 1 & 0 \end{bmatrix}$, then: $B^{-1}A^{-1} =$

A. $\begin{bmatrix} -1 & 2 \\ 5 & 9 \end{bmatrix}$

B. $\begin{bmatrix} -1 & 2 \\ -5 & 9 \end{bmatrix}$

C. $\begin{bmatrix} -1 & 2 \\ 5 & -9 \end{bmatrix}$

D. $\begin{bmatrix} 1 & 2 \\ 5 & -9 \end{bmatrix}$

Answer:

Watch Video Solution

18. If square matrices A and B are such that $A^2 = A, B^2 = B$ and A,B commut4e for multiplication, then

A. $(AB)^2 = O$

B. $(AB)^2 = I$

C. $(AB)^2 = AB$

D. $(AB)^2 = -AB$

Answer:

Watch Video Solution

19. If $A = [a_{ij}]_{3\times 3}$ is a scalar matrix such that $a_{ij} = 5$ for all $i = j$, then: $|A| =$

A. 5

B. 10

C. 25

D. 125

Answer:

Watch Video Solution

20. If $A = \begin{bmatrix} 1 & a \\ 0 & 1 \end{bmatrix}$, then, for all $n \in N$, matrix $A^n =$

A. $\begin{bmatrix} n & a \\ 0 & n \end{bmatrix}$

B. $\begin{bmatrix} 1 & a^n \\ 0 & 1 \end{bmatrix}$

C. $\begin{bmatrix} 1 & na \\ 0 & 1 \end{bmatrix}$

D. $\begin{bmatrix} n & na \\ 0 & n \end{bmatrix}$

Answer:

Watch Video Solution

21. If $A = \begin{bmatrix} 0 & 5 \\ 4 & 0 \end{bmatrix}$ and $A^{-1} = kA$, then: $k =$

A. $\frac{1}{10}$

B. $\frac{1}{20}$

C. 10

D. 20

Answer:

Watch Video Solution

22. If $f(x) = 1 + x + x^2 + x^3$ and $A = \begin{bmatrix} 0 & 3 \\ 0 & 0 \end{bmatrix}$, then: $f(A) =$

A. $\begin{bmatrix} 1 & 3 \\ 0 & 1 \end{bmatrix}$

B. $\begin{bmatrix} 0 & 3 \\ 1 & 1 \end{bmatrix}$

C. $\begin{bmatrix} 3 & 1 \\ 0 & 1 \end{bmatrix}$

D. $\begin{bmatrix} 1 & 0 \\ 0 & 3 \end{bmatrix}$

Answer:

Watch Video Solution

23. If $A = -BAB^{-1}$, then: $(A+B)^2 =$

A. $A+B$

B. A^2+B^2

C. O

D. $2AB$

Answer: B

Watch Video Solution

24. If ω is a complex cube -root of unity and $A' = \begin{bmatrix} \omega \\ \omega \end{bmatrix}$ and $B' = [1\omega]$, then: $AB =$

A. $[1]$

B. $[\omega]$

C. $[-1]$

D. $[\omega^2]$

Answer:

Watch Video Solution

25. If $\det(adjA) = |A|^2$, then the order of matrix A is

A. 2×2

B. 3×3

C. 2×3

D. 3×2

Answer: B

Watch Video Solution

26. If $A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ a & b & -1 \end{bmatrix}$, then A^2 is equal to

A. O

B. I

C. A

D. $-A$

Answer: B

Watch Video Solution