MATHS

BOOKS - HIMALAYA MATHS (KANNADA ENGLISH)

MATRICES AND DETERMINANTS

Question Bank

1. If A is singular matrix then adj A is

A. non-singular

B. singular

C. symmetric

D. not defined

Answer: B

View Text Solution

2. If B is a non-singular matrix and A is a square matrix then det $\left(B^{-1}AB\right) =$

A. det $\left(A^{-1}\right)$

B. det $\left(B^{-1}\right)$

C. det A.

D. det B.

Answer: C

Watch Video Solution

3. Let A and B be two non zero matrix if the product AB is a zero matrix, then

A. A and B are both singular

B. A is singular or B is singular

C. only A is singular

D. only B is singular

Answer: A

View Text Solution

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

A. A

B. $-A$

C. $2A$

D. $-2A$

Answer: C

View Text Solution

5. If $A = \begin{bmatrix} x & 1 \\ 1 & 0 \end{bmatrix}$ and $A^2 = I$ then $x =$

A. 0

B. 1

C. 2

D. 4

Answer: A

Watch Video Solution

6. If $A = \begin{bmatrix} 4 & 0 & 0 \\ 0 & 8 & 0 \\ 0 & 0 & 6 \end{bmatrix}$ then $A^{-1} =$

A. $\begin{bmatrix} 2 & 0 & 0 \\ 0 & 4 & 0 \\ 0 & 0 & 3 \end{bmatrix}$

B. $\begin{bmatrix} \frac{1}{4} & 0 & 0 \\ 0 & \frac{1}{8} & 0 \\ 0 & 0 & \frac{1}{6} \end{bmatrix}$

C. $\begin{bmatrix} \frac{1}{2} & 0 & 0 \\ 0 & \frac{1}{4} & 0 \\ 0 & 0 & \frac{1}{3} \end{bmatrix}$

D. $\begin{bmatrix} 0 & 0 & 4 \\ 0 & 8 & 0 \\ 6 & 0 & 0 \end{bmatrix}$

Answer: A

View Text Solution

7. If $A = \begin{bmatrix} 2 & -1 \\ -1 & 2 \end{bmatrix}$ and I is the unit matrix of order 2, then $A^2 =$

A. $\begin{bmatrix} 2 & 0 & 0 \\ 0 & 4 & 0 \\ 0 & 0 & 3 \end{bmatrix}$

B. $\begin{bmatrix} \frac{1}{4} & 0 & 0 \\ 0 & \frac{1}{8} & 0 \\ 0 & 0 & \frac{1}{6} \end{bmatrix}$

C. $\begin{bmatrix} \frac{1}{2} & 0 & 0 \\ 0 & \frac{1}{4} & 0 \\ 0 & 0 & \frac{1}{3} \end{bmatrix}$

D. $\begin{bmatrix} 0 & 0 & 4 \\ 0 & 8 & 0 \\ 6 & 0 & 0 \end{bmatrix}$

Answer: B

View Text Solution

8. The multiplicative inverse of the matrix

$A = \begin{bmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$ is

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

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

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

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

Answer: D

View Text Solution

9. If a, b, c are non-zero real numbers, then the inverse of the matrix $A\begin{bmatrix} a & 0 & 0 \\ 0 & b & 0 \\ 0 & 0 & c \end{bmatrix}$ is

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

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

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

D. $\frac{1}{abc}\begin{bmatrix}a & 0 & 0\\ 0 & b & 0\\ 0 & 0 & c\end{bmatrix}$

Answer: A

Watch Video Solution

10. If $P=\begin{bmatrix}i & 0 & -i\\ 0 & -i & i\\ -i & i & 0\end{bmatrix}, Q=\begin{bmatrix}-i & i\\ 0 & 0\\ i & -i\end{bmatrix}$ then $PQ=$

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

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

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

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

Answer: B

Watch Video Solution

11. If $\begin{bmatrix} \alpha & \beta \\ \gamma & -\alpha \end{bmatrix}$ is to be square root of the two rowed unit matrix, then α, β and γ should satisfy the relation

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

View Text Solution

12. If A and B are square matrices of same order such that,

$(A+B)^2 = A^2 + B^2 + 2AB$, then

A. $AB = BA$

B. $A = B$

C. $A = B'$

D. $A = -B$

Answer: A

View Text Solution

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

A. -7

B. 7

C. 0

D. 2

Answer: A

View Text Solution

14. $A^2 - A + I = 0$, then the inverse of A is

A. A^{-2}

B. $A + I$

C. $F - A$

D. A

Answer: C

View Text Solution

15. A is a 3 xx 3 matrix and B is its adjoint matrix. If $|B| = 81$, then $|A| =$

A. ± 3

B. ± 4

C. ± 9

D. ± 7

Answer: C

View Text Solution

16. If $A = \begin{bmatrix} a & 0 & 0 \\ 0 & a & 0 \\ 0 & 0 & a \end{bmatrix}$ then $|adj A| =$

A. a^3

B. . a^6

C. a^9

D. a^{27}

Answer: B

View Text Solution

17. For a 3×3 matrix A, if $\det A = 3$, then $\det(adjA) =$

A. -3

B. 3

C. 9

D. 27

Answer: C

View Text Solution

18. If $(1x2)\begin{bmatrix}1 & 2 & 3\\ 0 & 1 & 5\\ 0 & 2 & 3\end{bmatrix}\begin{bmatrix}x\\ -1\\ 2\end{bmatrix}=0$ then $x=$

A. $\frac{6}{5}$

B. $-\frac{6}{5}$

C. $\frac{5}{6}$

D. $-\frac{5}{6}$

Answer: B

View Text Solution

19. If A and B are two matrices such that $AB=B$ and $BA=A$, then $A^2+B^2=$

A. 2 A B

B. 2 B A

C. A+B

D. A B

Answer: C

View Text Solution

20. If $A = \begin{bmatrix} 3 & -4 \\ 1 & -1 \end{bmatrix}$ then the value of $A^n =$

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

B. $\begin{bmatrix} 2+n & 5-n \\ n & -n \end{bmatrix}$

C. $\begin{bmatrix} 3^n & (-4)^n \\ 1 & (-1)^n \end{bmatrix}$

D. None of these

Answer: D

View Text Solution

21. If A is a square matrix of order n, then $\det(adjA) =$

A. $(\det A)^{n-1}$

B. (det A)^(n-2)

C. $(\det A)^{n}$

D. None of these

Answer: A

View Text Solution

22. For any 2×2 matrix A, if $A.\, adjA = \begin{bmatrix} 7 & 0 \\ 0 & 7 \end{bmatrix}$ then $|A|$ is equal to

A. 7

B. 14

C. 49

D. 0

Answer: A

View Text Solution

23. If $A = \begin{bmatrix} 1 & -1 & 2 \\ 2 & 1 & -1 \\ -1 & 2 & 1 \end{bmatrix}$, then $\det[adj.\,(adjA)] =$

A. $(14)^3$

B. $(14)^4$

C. 14

D. $(14)^2$

Answer: B

View Text Solution

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

A. 3A

B. 2A

C. 4A

D. A

Answer: A

Watch Video Solution

25. If $A = \begin{bmatrix} 0 & c & -b \\ -c & 0 & a \\ b & -a & 0 \end{bmatrix}$ and $B = \begin{bmatrix} a^2 & ab & ac \\ ab & b^2 & bc \\ ac & bc & c^2 \end{bmatrix}$ then A B=

A. B

B. A

C. 0

D. I_3

Answer: C

Watch Video Solution

26. If the matrix A B is a zero matrix, then

A. It is not necessary that either $A = 0$ or $B = 0$

B. $A = 0$ or $B = 0$

C. $A = 0$ and $B = 0$

D. all the above statement are wrong

Answer: A

Watch Video Solution

27. If $AB = A$ and $BA = B$, then $B^2 =$

A. B

B. A

C. $-A$

D. $-B$

Answer: A

Watch Video Solution

28. If $A = \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$ and $n \in N$, then A^n equals :

A. $2^{n-1}. A$

B. $n^2. A$

C. $2^{n+1}. A$

D. $2^{n}. A$

Answer: A

Watch Video Solution

29. If $A = \begin{bmatrix} i & 0 \\ 0 & i \end{bmatrix}, n \in N$, then $A^{4n} =$

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. $\begin{bmatrix} -i & 0 \\ 0 & -i \end{bmatrix}$

Answer: C

View Text Solution

30. If A be a square matrix of order 3. If $|A| = -2$ then the value of the determinant $|A|.\, adjA$ is

A. 8

B. -8

C. -1

D. -32

Answer: D

View Text Solution

31. If $A = \begin{bmatrix} 0 & -i & 1 \\ 0 & 2 & -3 \\ 2 & 1 & 0 \end{bmatrix}$ and $B = adjA, \quad C = 5A,$ then $\dfrac{|adjB|}{|C|} =$

A. 5

B. 25

C. -1

D. 1

Answer: D

View Text Solution

32. If $A = \begin{bmatrix} a & 0 & 0 \\ 0 & a & 0 \\ 0 & 0 & a \end{bmatrix}$ then $|adjA| =$

A. a^{27}

B. a^{9}

C. a^{2}

D. a^{6}

Answer: D

View Text Solution

33. The inverse of a symmetric matrix is

A. diagonal matrix

B. symmetric matrix

C. skew-symmetric matrix

D. none of these

Answer: B

View Text Solution

34. Let $X = \begin{bmatrix} x1 \\ x2 \\ x3 \end{bmatrix}, A = \begin{bmatrix} 1 & -1 & 2 \\ 2 & 0 & 1 \\ 3 & 2 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 3 \\ 1 \\ 4 \end{bmatrix}$. If $AX = B$

, then $X =$

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

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

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

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

Answer: D

View Text Solution

35. If A is a 3×3 non-singular matrix such that $A = A^{-1}$ and $|A| \neq 1$, then $|adjA| =$

A. 1

B. $|A|$

C. $|A|^3$

D. 0

Answer: A

View Text Solution

36. Let $X=\begin{bmatrix}x\\y\\z\end{bmatrix}, D=\begin{bmatrix}3\\5\\11\end{bmatrix}$ and $A=\begin{bmatrix}1&-1&2\\2&1&1\\4&-1&-2\end{bmatrix}$. If $X=A^{-1}D$ then $X=$

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

B. $\begin{bmatrix}\frac{8}{3}\\\frac{-1}{3}\\0\end{bmatrix}$

C. $\begin{bmatrix}\frac{-8}{3}\\1\\0\end{bmatrix}$

D. $\begin{bmatrix}\frac{8}{3}\\\frac{1}{3}\\-1\end{bmatrix}$

Answer: B

View Text Solution

37. If $A = \begin{bmatrix} 4 & -3 \\ -2 & 2 \end{bmatrix}$ and I is the unit matrix of order 2, then $A^2 =$

A. $6A + 2I$

B. $6A - 2I$

C. $A - I$

D. $A + I$

Answer: B

View Text Solution

38. If A is symmetric as well as skew symmetric then A

A. is a diagonal matrix

B. is a null matrix

C. is a triangular matrix

D. such matrix does not exist

Answer: B

View Text Solution

39. The eigen values of the matrix $A = \begin{bmatrix} 2 & 3 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 2 \end{bmatrix}$ are

A. $2, \ -1, 2$

B. $-2, \ -1, 2$

C. $2, \ -1, \ -2$

D. $2, 1, 2$

Answer: D

Watch Video Solution

40. If $A = \begin{bmatrix} 2 & -3 \\ 2 & -4 \end{bmatrix}$ then $|A^2 + 2A| =$

A. -4

B. 4

C. 2

D. -2

Answer: B

View Text Solution

41. The constant term in the characteristic polynomial of the matrix

$$A=\begin{bmatrix}-1 & 1 & 1\\ 1 & -1 & 1\\ 1 & 1 & -1\end{bmatrix}\text{ is}$$

A. 4

B. -4

C. 0

D. 1

Answer: A

View Text Solution

42. The constant term in the characteristic polynomial of the matrix

$$A=\begin{bmatrix}2 & -3\\ 4 & 1\end{bmatrix}\text{is}$$

A. 10

B. -10

C. 14

D. -14

Answer: C

View Text Solution

43. If A is a square matrix such that $A^2 = A$ then $\det A =$

A. 0 or I

B. -2 or 2

C. -3 or 3

D. none of these

Answer: A

Watch Video Solution

44. Let A and B are matrices such that A+B and B A are both defined, then

A. 1)A and B are square matrices of different order

B. 2)A and B are square matrices of same order

C. 3)A and B are of same order

D. 4)number of columns of A= number of rows of B

Answer: B

Watch Video Solution

45. Let $A = \begin{bmatrix} 1 & -1 \\ 2 & -1 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & a \\ 4 & b \end{bmatrix}$. If $(A+B)^2 = A^2 + B^2$, then $(a, b) =$

A. (1,-1)

B. (-1,1)

C. (1,1)

D. (-1,-1)

Answer: A

Watch Video Solution

46. If $A = \begin{bmatrix} x & 1 \\ 1 & 0 \end{bmatrix}$ and $A^2 = I$ then $x =$

A. 0

B. 1

C. 2

D. 4

Answer: A

Watch Video Solution

47. If $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ and $J = \begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$,

then $B =$

A. $I\cos\theta + J\sin\theta$

B. $I\cos 0 - J\sin\theta$

C. $I\sin\theta + J\cos\theta$

D. $I\sin\theta - J\cos\theta$

Answer: B

Watch Video Solution

48. If $A = \begin{bmatrix} 1 & 2 \\ 5 & 4 \end{bmatrix}$ then $(A+I)(A-6I) =$

A. A

B. O

C. 4I

D. I

Answer: B

Watch Video Solution

49. If $\begin{bmatrix} i & 0 \\ 3 & -i \end{bmatrix} + A = \begin{bmatrix} i & 2 \\ 3 & 4+i \end{bmatrix} - A$, then $A =$

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

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

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

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

Answer: C

Watch Video Solution

50. If $A = \begin{bmatrix} x & 1 \\ 0 & x \end{bmatrix}$ then $A^n =$

A. $\begin{bmatrix} x^n & nx^{n-1} \\ 0 & x^n \end{bmatrix}$

B. $\begin{bmatrix} nx^{n-1} & x^n \\ 0 & x^n \end{bmatrix}$

C. $\begin{bmatrix} x^n & 0 \\ nx^{n-1} & x^n \end{bmatrix}$

D. $\left[\left[x^n, x^n\right], \left[0, nx^{n-1}\right]\right]$

Answer: A

Watch Video Solution

51. Let $A = \begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix}$. Then $A^n =$

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

B. [[1,n,sumn],[0,1,n],[0,0,1]]

C. [[1,sumn,n],[0,1,n],[0,0,1]]

D. [[1,n,n],[0,1,sumn],[0,0,1]]

Answer: B

Watch Video Solution

52. If $A = \begin{bmatrix} ab & b^2 \\ -a^2 & -ab \end{bmatrix}$ then $A^2 =$

A. I

B. O

C. $-I$

D. A

Answer: B

Watch Video Solution

53. If $A = \begin{bmatrix} i & 0 \\ 0 & i \end{bmatrix}$ then $A^{4n} (n \in N)$ equals :

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

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

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

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

Answer: C

Watch Video Solution

54. If $A = \begin{bmatrix} a & b \\ c & -a \end{bmatrix}$ is such that $A^2 = I$, then a,b,c satisfy the relation

A. $1 + a^2 + bc = 0$

B. $1 - a^2 - bc = 0$

C. $1+a^2-bc=0$

D. $1-a^2+bc=0$

Answer: B

Watch Video Solution

55. If $A=\begin{bmatrix}a & 0 & 0\\ 0 & a & 0\\ 0 & 0 & a\end{bmatrix}$ then `A^n='

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

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

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

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

Answer: C

Watch Video Solution

56. If $A = \begin{bmatrix} 1 & a \\ 0 & 1 \end{bmatrix}$, $then$lim _(n to oo)(1)/(n) A^n` is

A. I

B. O

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

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

Answer: B

Watch Video Solution

57. If the matrix A is such that $\begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix}.A = \begin{bmatrix} 3 & 2 \\ -1 & 1 \end{bmatrix}$ then $A =$

A. $\begin{bmatrix} 9 & 1 \\ 5 & 0 \end{bmatrix}$

B. $\begin{bmatrix} -9 & 1 \\ 5 & 0 \end{bmatrix}$

C. $\begin{bmatrix} 9 & 1 \\ -5 & 0 \end{bmatrix}$

D. $\begin{bmatrix} 9 & -1 \\ 5 & 0 \end{bmatrix}$

Answer: C

Watch Video Solution

58. If the matrix A is such that $A\begin{bmatrix} -1 & 2 \\ 3 & 1 \end{bmatrix} = \begin{bmatrix} -4 & 1 \\ 7 & 7 \end{bmatrix}$ then $A =$

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

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

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

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

Answer: C

Watch Video Solution

59. If $A = \begin{bmatrix} 1 & \frac{1}{2} \\ 0 & 1 \end{bmatrix}$ $then$ A^(64)= `

A. $\begin{bmatrix} 1 & 32 \\ 32 & 1 \end{bmatrix}$

B. $\begin{bmatrix} 1 & 0 \\ 32 & 1 \end{bmatrix}$

C. $\begin{bmatrix} 1 & 32 \\ 0 & 1 \end{bmatrix}$

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

Answer: C

Watch Video Solution

60. If $A = \begin{bmatrix} 1 & -2 \\ x & y \end{bmatrix}$ and $AA' = I$ then $x =$

A. 1

B. 2

C. 0

D. there exists no value for x

Answer: D

Watch Video Solution

61. If $A = \begin{bmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{bmatrix}$, then $A^{2n} =$ where n is a positive integer.

A. 1)adj A

B. 2)A

C. 3)I

D. 4)A

Answer: C

Watch Video Solution

62. If $A = \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$, then $A^4 =$

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

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

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

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

Answer: A

Watch Video Solution

63. The order of $\begin{bmatrix} x & y & z \end{bmatrix} \begin{bmatrix} a & h & g \\ h & b & f \\ g & f & c \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix}$ is

A. 3×1

B. 1×1

C. 1×3

D. 3×3

Answer: B

Watch Video Solution

64. If $\begin{bmatrix} 1 & 2 & 3 \end{bmatrix}. B = (3, 4)$, then the oredr of the matrix is

A. 3×1

B. 1×3

C. 2×3

D. 3×2

Answer: D

Watch Video Solution

65. If $A = \begin{bmatrix} 0 & 3 \\ -3 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 4 \\ -4 & 0 \end{bmatrix}$ then $A + B$ is a

A. diagonal matrix

B. skew symmetric matrix

C. symmetric matrix

D. unit matrix

Answer: B

Watch Video Solution

66. Let $A = \begin{bmatrix} 0 & 1 & 4 \\ -1 & 0 & -5 \\ -4 & 5 & 0 \end{bmatrix}$ then A^4 is a

A. skew symmetric matrix

B. non singular matrix

C. unit matrix

D. symmetric matrix

Answer: D

Watch Video Solution

67. If $A = \begin{bmatrix} 0 & -2 & 3 \\ 2 & 0 & -1 \\ -3 & 1 & 0 \end{bmatrix}$ then A^5 is

A. a unit matrix

B. non singular matrix

C. skew symmetric matrix

D. symmetric matrix

Answer: C

Watch Video Solution

68. If $A = \begin{bmatrix} 3 & -4 \\ 2 & 3 \end{bmatrix}$ then $A - A'$ is

A. null matrix

B. unit matrix

C. skew symmetric matrix

D. symmetric matrix

Answer: C

Watch Video Solution

69. If $A = B + C$ such that B is a symmetric matrix and C is a skew - symmetric matrix , then B is given by :

A. $A + A'$

B. $A - A'$

C. $12(A + A')$

D. 12(A-A^prime)

Answer: C

Watch Video Solution

70. Let A and B be 3×3 matrices such that A' = - A , B ' = B , then matrix $\lambda AB + 3BA$ is a skew - symmetric matrix for :

A. $\lambda = -3$

B. $\lambda = 3$

C. $\lambda = 3 \text{ or } -3$

D. . $\lambda = 3 \text{ and } -3$

Answer: B

Watch Video Solution

71. If A and B are non singular square matrices of same order, then which of the following is not true:

A. $(AB)^{-1} = B^{-1}.A^{-1}$

B. $adj(AB) = (adjB)(adjA)$

C. $AB = 0 \Rightarrow |A| = 0 \text{ or } |B| = 0$

D. $(A+B)^{-1} = B^{-1} + A^{-1}$

Answer: D

Watch Video Solution

72. If A,B are square matrices of order 3 , then :

A. $(A+B)^{-1} = A^{-1} + B^{-1}$

B. $AB = 0 \Rightarrow |A| = 0 \text{ or } |B| = 0$

C. $AB = 0 \Rightarrow |A| = 0 \text{ and } |B| = 0$

D. (A . B)^-1=A^-1 . B^-1

Answer: B

Watch Video Solution

73. If $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$, then $adj(adjA) =$

A. adj A

B. A'

C. A

D. $-A$

Answer: C

Watch Video Solution

74. If $A=\begin{bmatrix}4 & -1\\ -1 & 3\end{bmatrix}$, then $A.\ adjA=$

A. $\begin{bmatrix}0 & 10\\ 10 & 0\end{bmatrix}$

B. $\begin{bmatrix}11 & 0\\ 0 & 11\end{bmatrix}$

C. $\begin{bmatrix}1 & 10\\ 10 & 1\end{bmatrix}$

D. $\begin{bmatrix}10 & 10\\ 10 & 10\end{bmatrix}$

Answer: B

Watch Video Solution

75. Let A be a square matrix with real entries, such that $A^{97}=A^{-1}$.

Then

A. A=I

B. |A|=pm 1

C. |A|=1

D. A=A^-1

Answer: B

View Text Solution

76. If $\begin{pmatrix} 1 & -\tan\theta \\ \tan\theta & 1 \end{pmatrix}\begin{pmatrix} 1 & \tan\theta \\ -\tan\theta & 1 \end{pmatrix}^{-1} = \begin{pmatrix} a & -b \\ b & a \end{pmatrix}$ then :

A. $a = \sin 2\theta, \quad b = \cos 2\theta$

B. $a = 1, b = 1$

C. $a = \cos 2\theta, b = \sin 2\theta$

D. $a = \sin\theta, b = \cos\theta$

Answer: C

Watch Video Solution

77. If $A = \begin{bmatrix} 2 & 3 \\ 1 & -2 \end{bmatrix}$ and $A^{-1} = \alpha A,$ then the value of α is :

A. 7

B. -7

C. (1)/(7)

D.

Answer: C

Watch Video Solution

78. For a square matrix A and a non singular matrix B of the same order , the value of det $(B^{-1}AB)$ is :

A. $|A|$

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

C. $|B|$

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

Answer: A

Watch Video Solution

79. If A and B are two square matrices of the same order such that $AB = B$ and $BA = A$, then $A^2 + B^2$ is always equal to

A. 2AB

B. 2BA

C. AB

D. A+B

Answer: D

Watch Video Solution

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

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

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

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

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

Answer: A

Watch Video Solution

81. If $A = \begin{bmatrix} -2 & 2 \\ 3 & 1 \end{bmatrix}$ then $8A^{-1} =$

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

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

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

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

Answer: C

Watch Video Solution

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

A. A'

B. -A

C. I

D. adj A

Answer: A

Watch Video Solution

83. If the matrix $A=\begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & \lambda \end{bmatrix}$ is singular, then $\lambda=$

A. 3

B. 4

C. 2

D. 5

Answer: A

View Text Solution

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

A. $A^3=A$

B. $A^3=A^2-A$

C. $A^3 + A^2 = 0$

D. $A^3 = A^{-1}$

Answer: D

View Text Solution

85. If $A = \begin{bmatrix} 3 & -2 \\ 1 & 2 \end{bmatrix}$ and $A^2 + kA + 8I = 0$, then $k =$

A. a.3

B. b.2

C. c.5

D. d.-5

Answer: D

Watch Video Solution

86. If $A = \begin{bmatrix} 1 & 0 \\ -1 & 7 \end{bmatrix}$ and $A^2 - 8A + kI = 0$, then $k =$

A. a.-7

B. b.7

C. c.8

D. d.`(1)/(7)

Answer: B

Watch Video Solution

87. The sum of the eigen values of the matrix $A = \begin{bmatrix} 2 & -1 & 3 \\ 1 & 4 & 2 \\ 3 & 1 & 1 \end{bmatrix}$ is

A. 6

B. 8

C. 7

D. 2

Answer: C

Watch Video Solution

88. The product of the eigen values of the matrix $A=\begin{bmatrix}3 & -1 \\ 2 & 3\end{bmatrix}$ is

A. 11

B. 6

C. 9

D. 0

Answer: A

Watch Video Solution

89. If 4,-3 are the eigen values of a 2×2 matrix A and $|A| = 6$, then the eigen values of $adj A$ are

A. a. $\frac{1}{4}, \ -\frac{1}{3}$

B. b. $-4, 3$

C. c. $\frac{3}{2}, \ -2$

D. d. $\frac{2}{3}, \ -\frac{1}{2}$

Answer: C

Watch Video Solution

90. If $A = \begin{bmatrix} 1 & a \\ 0 & 1 \end{bmatrix}$, $then$lim _(n to oo)(1)/(n) A^n` is

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

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

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

D. none of these

Answer: A

Watch Video Solution

91. Let k be a positive real number and let $|A| = (2k+1)^3$ and $B = \begin{bmatrix} 0 & 2k & -\sqrt{k} \\ -2k & 0 & 2\sqrt{k} \\ \sqrt{k} & -2\sqrt{k} & 0 \end{bmatrix}$. If $|adjA| + |adjB| = 10^6$ then $[k] =$

([k]= the greatest integer less than or equal to k)

A. 3

B. 4

C. 5

D. 6

Answer: B

Watch Video Solution

92. If $A = \begin{bmatrix} -1 & 2 & 1 \\ 1 & -1 & 2 \\ 2 & 1 & 1 \end{bmatrix}$, then $\det(adj(adjA)) =$

A. 12

B. $(12)^2$

C. $(12)^3$

D. $(12)^4$

Answer: D

Watch Video Solution

93. For a 3×3 matrix A, if $A.\,(adjA) = [[3, 0, 0], [0, 3, 0[, [0, 0, 3]]$ then $|A| =$

A. a.9

B. b.3

C. c.27

D. d.0

Answer: B

Watch Video Solution

94. If $A = \begin{bmatrix} 4 & x+2 \\ 2x-3 & x-1 \end{bmatrix}$ is symmetric then$x =$

A. a.3

B. b.5

C. c,2

D. d.4

Answer: B

Watch Video Solution

95. If $A = \begin{bmatrix} 2 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 2 \end{bmatrix}$ then $A^6 =$

A. a.6A

B. b.12A

C. c.32A

D. d.64A

Answer: C

Watch Video Solution

96. Total number of possible symmetric matrices of order3×3, whose entries 0 or 2 .

A. 8

B. 64

C. 512

D. 18

Answer: B

Watch Video Solution

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

A. $m \times m$

B. $n \times n$

C. $n \times m$

D. $m \times n$

Answer: D

Watch Video Solution

98. If A and B are matrices of same order then $(AB' - BA')$ is

A. skew symmetric matrix

B. null matrix

C. symmetric matrix

D. unit matrix

Answer: A

Watch Video Solution

99. If A is a square matrix such that $A^2 = I$, then : $(A - I)^3 + (A + I)^3 - 7A$ is equal to :

A. A

B. I-A

C. I+A

D. 3A

Answer: A

Watch Video Solution

100. On using elementary operation $C_2 \to C_2 - 2C_1$ in the following matrix equation : $\begin{bmatrix} 1 & -3 \\ 2 & 4 \end{bmatrix} = \begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}\begin{bmatrix} 3 & 1 \\ 2 & 4 \end{bmatrix}$ we have :

A. $\begin{bmatrix} 1 & -5 \\ 0 & 4 \end{bmatrix} = \begin{bmatrix} 1 & -1 \\ -2 & 2 \end{bmatrix}\begin{bmatrix} 3 & -5 \\ 2 & 0 \end{bmatrix}$

B. $\begin{bmatrix} 1 & -5 \\ 0 & 4 \end{bmatrix} = \begin{bmatrix} 1 & -1 \\ 0 & 1 \end{bmatrix}, \begin{bmatrix} 3 & -5 \\ 0 & 2 \end{bmatrix}$

C. $\begin{bmatrix} 1 & -5 \\ 2 & 0 \end{bmatrix} = \begin{bmatrix} 1 & -3 \\ 0 & 1 \end{bmatrix}, \begin{bmatrix} 3 & 1 \\ -2 & 4 \end{bmatrix}$

D. $\begin{bmatrix} 1 & -5 \\ 2 & 0 \end{bmatrix} = \begin{bmatrix} 1 & -1 \\ 0 & 1 \end{bmatrix}, \begin{bmatrix} 3 & -5 \\ 2 & 0 \end{bmatrix}$

Answer: D

Watch Video Solution

101. On using clementary row operation R_1 to R_1-3 R_2

$\in the follow \in gmatrixequation$[[4,2],[3,3]]=[[1,2],[0,3]][[2,0],[1,1]]`

we have,

A. $\begin{bmatrix} -5 & -7 \\ 3 & 3 \end{bmatrix} = \begin{bmatrix} 1 & -7 \\ 0 & 3 \end{bmatrix} \begin{bmatrix} -1 & -3 \\ 1 & 1 \end{bmatrix}$

B. $\begin{bmatrix} -5 & -7 \\ 3 & 3 \end{bmatrix} = \begin{bmatrix} 1 & 2 \\ 0 & 3 \end{bmatrix} \begin{bmatrix} -1 & -3 \\ 1 & 1 \end{bmatrix}$

C. $\begin{bmatrix} -5 & -7 \\ 3 & 3 \end{bmatrix} = \begin{bmatrix} 1 & 2 \\ 1 & -7 \end{bmatrix} \begin{bmatrix} 2 & 0 \\ 1 & 1 \end{bmatrix}$

D. $\begin{bmatrix} 4 & 2 \\ 3 & 3 \end{bmatrix} = \begin{bmatrix} 1 & 2 \\ -3 & -3 \end{bmatrix} \begin{bmatrix} 2 & 0 \\ 1 & 1 \end{bmatrix}$

Answer: A

Watch Video Solution

102. If matrix $A = [a_{ij}]_{2 \times 2}$ where $a_{ij} \begin{matrix} -1 & \text{if } i \neq j \\ = 0 & \text{if } i = j \end{matrix}$ then A^2 is equal to :

A. I

B. A

C. O

D. none of these

Answer: A

Watch Video Solution

103. If $A = \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$, then A^2 equal to_____

A. $[[0, 1][1, 0]]$

B. $[[0, 1][1, 0]]$

C. $[[0, 1][0, 1]]$

D. $[[1, 0][0, 1]]$

Answer: D

Watch Video Solution

104. A and B are two matrices of the order $3 \times m$ and $3 \times n$ respectively, and m=n, then the order of the matrix $(5A - 2B)$ is

A. $m \times 3$

B. 3×3

C. $m \times n$

D. $3 \times n$

Answer: D

Watch Video Solution

105. If $A = \frac{1}{\pi}\begin{bmatrix} \sin^{-1}(\pi x) & \tan^{-1}\left(\frac{x}{\pi}\right) \\ \sin^{-1}\left(\frac{x}{\pi}\right) & \cot^{-1}\left(\frac{x}{\pi}\right) \end{bmatrix}$

$B = \frac{1}{\pi}\begin{bmatrix} -\cos^{-1}(\pi x) & \tan^{-1}\left(\frac{x}{\pi}\right) \\ \sin^{-1}\left(\frac{x}{\pi}\right) & -\tan^{-1}\left(\frac{x}{\pi}\right) \end{bmatrix}$

then A - B is equal to

A. I

B. O

C. 2I

D. (1)/(2)

Answer: D

Watch Video Solution

106. If $\begin{bmatrix} 2x+y & 4x \\ 5x-7 & 4x \end{bmatrix} = \begin{bmatrix} 7 & 7y-13 \\ y & x+6 \end{bmatrix}$, then the value of x and y is

:

Watch Video Solution

107. Total number of possible symmetric matrices of order 3×3, whose entries 0 or 2 .

A. 9

B. 27

C. 81

D. 512

Answer: D

Watch Video Solution

108. If x,y,z are nonzero real number , then the inverse of matrix $A = \begin{bmatrix} x & 0 & 0 \\ 0 & y & 0 \\ 0 & 0 & z \end{bmatrix}$ is

A. $A = \begin{bmatrix} x^{-1} & 0 & 0 \\ 0 & y^{-1} & 0 \\ 0 & 0 & z^{-1} \end{bmatrix}$

B. $xyz \begin{bmatrix} x^{-1} & 0 & 0 \\ 0 & y^{-1} & 0 \\ 0 & 0 & z^{-1} \end{bmatrix}$

C. $\frac{1}{xyz} \begin{bmatrix} x & 0 & 0 \\ 0 & y & 0 \\ 0 & 0 & z \end{bmatrix}$

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

Answer: A

Watch Video Solution

109. Which of the given values of x and y make the following pair of matrices equal

$$\begin{bmatrix} 3x+7 & 5 \\ y+1 & 2-3x \end{bmatrix}, \begin{bmatrix} 0 & y-2 \\ 8 & 4 \end{bmatrix}$$

A. $x = -\frac{1}{3}, y = 7$

B. not possible to find

C. y=7, x=-(2)/(3)

D. x=-(1)/(3), y=-(2)/(3)

Answer: B

Watch Video Solution

110. If $A = \begin{bmatrix} \alpha & \beta \\ \gamma & -\alpha \end{bmatrix}$ is such that $A^2 = I$, then

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

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

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

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

Answer: C

Watch Video Solution

111. If the matrix A is both symmetric and skew symmetric, then

A. A is a diagonal matrix

B. A is a zero matrix

C. A is a square matrix

D. none of these

Answer: B

Watch Video Solution

112. If A is square matrix such that $A^2 = A$, then $(I + A)^3 - 7A$ is equal to

A. A

B. I-A

C. I

D. 3A

Answer: C

Watch Video Solution

113. Matrices A and B will be inverse of each other only if

A. A B=B A

B. A B=B A=O

C. A B=O, B A=I

D. A B=B A=I

Answer: D

Watch Video Solution

114. If A, B are symmetric matrices of same order, then $AB - BA$ is a

A. Skew symmetric matrix

B. Symmetric matrix

C. Zero matrix

D. Identity matrix

Answer: A

Watch Video Solution

115. If $A = \begin{bmatrix} \cos\alpha & -\sin\alpha \\ \sin\alpha & \cos\alpha \end{bmatrix}$, and $A + A' = I$, then the value of α is

A. $\frac{\pi}{6}$

B. $\frac{\pi}{3}$

C. pi

D. $\frac{3}{\pi 2}$

Answer: B

Watch Video Solution

116. Assume X, Y, Z, W and P are matrices of order $2 \times n, 3 \times k, 2 \times p, n \times 3$ and $p \times k$, respectively.

The restriction on n, k and p so that $PY + WY$ will be defined are:

A. $k = 3, p = n$

B. k is arbitrary p=2

C. p is arbitrary, k=3

D. $k = 2, p = 3$

Answer: A

Watch Video Solution

117. If X and Z are of order $2 \times n$ and $2 \times p$ respectively and $n = p$ then, $7X - 5Z$ is of order

A. $p \times 2$

B. $2 \times n$

C. `nxx 3

D. $p \times n$

Answer: B

Watch Video Solution

118. Prove that $\begin{vmatrix} b+c & a & a \\ b & c+a & b \\ c & c & b+a \end{vmatrix}$ = 4abc

A. 0

B. 4abc

C. a+b+c

D. abc

Answer: B

Watch Video Solution

119. $\Delta = \begin{bmatrix} 1 & 1+ac & 1+bc \\ 1 & 1+ad & 1+bd \\ 1 & 1+ac & 1+bc \end{bmatrix}$

A. a+b+c

B. 3

C. 1

D. 0

Answer: D

Watch Video Solution

120. If $\frac{1}{a}+\frac{1}{b}+\frac{1}{c}=0$ then $\begin{vmatrix} 1+a & 1 & 1 \\ 1 & 1+b & 1 \\ 1 & 1 & 1+c \end{vmatrix}$ =

A. 0

B. abc

C. $-abc$

D. $(abc)^{-1}$

Answer: B

Watch Video Solution

121. If a, b, c are all different from zero and $\Delta = \begin{vmatrix} 1+a & 1 & 1 \\ 1 & 1+b & 1 \\ 1 & 1 & 1+c \end{vmatrix} = 0$, then $\frac{1}{a} + \frac{1}{b} + \frac{1}{c} =$

A. abc

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

C. $-a-b-c$

D. -1

Answer: D

Watch Video Solution

Watch Video Solution

122. The value of the determinant :

$$\begin{vmatrix} 1 & 1 & 1 \\ {}^{m}C_1 & {}^{m+1}C_1 & {}^{m+2}C_1 \\ {}^{m}C_2 & {}^{m+1}C_2 & {}^{m+2}C_2 \end{vmatrix}$$ is equal to :

A. 1

B. -1

C. 0

D. none of these

Answer: A

Watch Video Solution

123. If a , b, c are all different from zero and $\begin{vmatrix} 1+a & 1 & 1 \\ 1 & 1+b & 1 \\ 1 & 1 & 1+c \end{vmatrix} = 0$ then the value of $1+\frac{1}{a}+\frac{1}{b}+\frac{1}{c}$ is :

A. $1+\Sigma a$

B. $1+\sum \frac{1}{a}$

C. a b c[1+sum (1)/(a)]

D. none of these

Answer: C

Watch Video Solution

124. $\begin{vmatrix} 77 & 78 & 79 \\ 76 & 75 & 74 \\ 75 & 74 & 73 \end{vmatrix} =$

A. a.0

B. b.-1

C. c.5

D. d.1

Answer: A

Watch Video Solution

125. $\Delta = \begin{vmatrix} x+a & b & c \\ b & x+c & a \\ c & a & x+b \end{vmatrix}$ which of the following is a factor for Δ

A. $x-(a+b+c)$

B. $x+(a+b+c)$

C. $a+b+c$

D. $-(a+b+c)$

Answer: B

Watch Video Solution

126. If $D = \begin{bmatrix} 1 & a & b \\ 1 & b & c \\ 1 & c & a \end{bmatrix}$, then $\begin{bmatrix} a & b & c \\ b & c & a \\ 1 & 1 & 1 \end{bmatrix}$ =`

A. D'

B. D

C. $-D$

D. none of these

Answer:

Watch Video Solution

127. The value of the determinant $\begin{vmatrix} a_1 & la_1 + mb_1 & b_1 \\ a_2 & la_2 + mb_2 & b_2 \\ a_3 & la_3 + mb_3 & b_3 \end{vmatrix} =$

A. 0

B. l

C. m

D. lm

Answer: A

Watch Video Solution

128. If ω is a complex cube root of unit, then the value of the determinant $\begin{vmatrix} 1 & \omega & \omega+1 \\ \omega+1 & 1 & \omega \\ \omega & \omega+1 & 1 \end{vmatrix} =$

A. 0

B. ω

C. 2

D. 4

Answer: D

Watch Video Solution

Watch Video Solution

129. If α, β, γ are the roots of $x^3 + px + q = 0$, then the value of the determine $\begin{vmatrix} \alpha & \beta & \gamma \\ \beta & \gamma & \alpha \\ \gamma & \alpha & \beta \end{vmatrix}$ is

A. p

B. q

C. $p^2 - 2q$

D. 0

Answer: D

Watch Video Solution

130. If $ax^4 + bx^3 + cx^2 + dx + e = \begin{vmatrix} x^3 + 3x & x - 1 & x + 3 \\ x + 1 & -2x & x - 4 \\ x - 3 & x + 4 & 3x \end{vmatrix}$,

then e =

A. 1

B. -1

C. 2

D. 0

Answer: D

Watch Video Solution

131. $\Delta = \begin{vmatrix} \log x & \log y & \log z \\ \log 2x & \log 2y & \log 2z \\ \log 3x & \log 3y & \log 3z \end{vmatrix} =$

A. a.0

B. b.$\log(xyz)$

C. c,$\log(6xyz)$

D. d.$6\log(xyz)$

Answer: A

Watch Video Solution

132. The value of the determine : $\Delta = \begin{vmatrix} 1! & 2! & 3! \\ 2! & 3! & 4! \\ 3! & 4! & 5! \end{vmatrix}$ is :

A. 2!

B. 3!

C. 4!

D. 5!

Answer: C

Watch Video Solution

133. The determinant:

$$\begin{vmatrix} xp+y & x & y \\ yp+z & y & z \\ 0 & xp+y & yp+z \end{vmatrix} = 0 \text{ if}:$$

A. x, y, z are in A.P

B. x, y, z are in G.P

C. x, y, z are in H.P

D. x y, y z, 2 x are in A.P

Answer: B

Watch Video Solution

134. If $f(x) = \begin{bmatrix} x-3 & 2x^2-18 & 3x^3-81 \\ x-5 & 2x^2-50 & 4x^3-500 \\ 1 & 2 & 3 \end{bmatrix}$ then $f(1).\ f(3) + f(3).\ f(5) + f(5).\ f(1) =$

A. $f(1)$

B. f(3)`

C. $f(1) + f(3)$

D. $f(1) + f(3) + f(5)$

Answer: B

Watch Video Solution

135. The value of n for which the determinant $\begin{vmatrix} 8C_3 & 9C_5 & 10C_7 \\ 8C_4 & 9C_6 & 10C_8 \\ 9C_n & 10C_n + 2 & 11C_n + 4 \end{vmatrix}$ becomes zero is

A. $n = 2$

B. $n = 3$

C. $n = 4$

D. for no value of n

Answer: C

Watch Video Solution

136. $\begin{bmatrix} 1 & 1 & 1 \\ 4 & 3 & 2 \\ 4^2 & 3^2 & 2^2 \end{bmatrix} =$

A. 2

B. -2

C. 1

D. 0

Answer: B

Watch Video Solution

137. If $\Delta = \begin{bmatrix} 0 & x & -y \\ -x & 0 & z \\ y & -z & 0 \end{bmatrix}$ then

A. $\Delta = 2xyz$

B. $\Delta = xyz_j$

C. $\Delta = 0$

D. $x^2 + y^2 + z^2$

Answer: C

Watch Video Solution

138. Let $\Delta = \begin{vmatrix} 1 & \sin\theta & 1 \\ -\sin\theta & 1 & \sin\theta \\ -1 & -\sin\theta & 1 \end{vmatrix}$, then Δ lies in the interval.

A. $[2, 3]$

B. $[3, 4]$

C. $[2, 4]$

D. $(2, 4)$

Answer: C

Watch Video Solution

139. If $\begin{bmatrix} p & q-y & r-z \\ p-x & q & r-z \\ p-x & q-y & r \end{bmatrix} = 0$, then $\frac{p}{x} + \frac{q}{y} + \frac{r}{z} =$

A. 2

B. 1

C. 0

D. 4 p q r

Answer: A

Watch Video Solution

140. A and B are matrices of order three and |A| =4, |B| =-1 . Then the determinant of 2 A B is

A. 32

B. -32

C. 16

D. 8

Answer: B

Watch Video Solution

141. If A and P are 3×3 matrices with integral entries such that P ' AP = A , then det . P is :

A. -1

B. 1

C. always ±1

D. ±1 provided $A \neq 0$

Answer: D

Watch Video Solution

142. Let A be a matrix of order 3×3, and B is its adjoint matrix. If $B = 81$, then $A =$

A. ± 6

B. ± 3

C. 9

D. 4

Answer: C

Watch Video Solution

143. IF A is a 3×3 matrix, $|A| \neq 0$ and $|3A| = k|A|$, then write the values of k.

A. $3.\ A$

B. 9A

C. 27A

D. A^3

Answer: C

Watch Video Solution

144. IF A is a 3×3 matrix, $|A| \neq 0$ and $|3A| = k|A|$, then write the values of k.

A. 9

B. 6

C. 3

D. 27

Answer: D

Watch Video Solution

145. If α, β and γ are roots of the equations $x^3 + px + q = 0$ then the value of det : $\begin{bmatrix} \alpha & \beta & \gamma \\ \beta & \gamma & \alpha \\ \gamma & \alpha & \beta \end{bmatrix}$ is

A. p

B. q

C. 0

D. 1

Answer: C

Watch Video Solution

146. $\Delta = \begin{vmatrix} x+a & b & c \\ b & x+c & a \\ c & a & x+b \end{vmatrix}$ which of the following is a factor for Δ

A. $x-(a+b+c)$

B. $x+(a+b+c)$

C. $a+b+c$

D. $-(a+b+c)$

Answer: B

Watch Video Solution

147. The value of $\Delta = \begin{bmatrix} 5^2 & 5^3 & 5^4 \\ 5^3 & 5^4 & 5^5 \\ 5^4 & 5^6 & 5^7 \end{bmatrix}$ is

A. 5^2

B. 0

C. 5^{13}

D. 5^9

Answer: B

Watch Video Solution

148. $\begin{bmatrix} 0 & p-q & p-r \\ q-p & 0 & q-r \\ r-p & r-q & 0 \end{bmatrix} =$

A. 0

B. $(p-q)(q-r)(r-p)$

C. pqr

D. 3p q r

Answer: A

Watch Video Solution

149. With the usual notation in the triangle A B C

$$\begin{bmatrix} 1 & 1 & 1 \\ \sin A & \sin B & \sin C \\ \sin^2 A & \sin^2 B & \sin^3 C \end{bmatrix} =$$

A. $\frac{1}{8R^3}(a-b)(a-c)(b-c)$

B. $8R^3$

C. $(a-b)(b-c)(c-a)$

D. $\frac{1}{8R}(a-b)(a-c)(b-c)$

Answer: A

Watch Video Solution

Watch Video Solution

150. If $A = \begin{bmatrix} -1 & 2 & 4 \\ 3 & 1 & 0 \\ -2 & 4 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} -2 & 4 & 2 \\ 6 & 2 & 0 \\ -2 & 4 & 8 \end{bmatrix}$ then B is given by

A. $B = 4A$

B. $B = -4A$

C. $B = -A$

D. $B = 6A$

Answer: B

Watch Video Solution

151. If $\begin{bmatrix} a & b & c \\ m & n & p \\ x & y & z \end{bmatrix} = k$, then $\begin{bmatrix} 6a & 2b & 2c \\ 3m & n & p \\ 3x & y & z \end{bmatrix} =$

A. $\frac{1}{6}k$

B. $2k$

C. $3k$

D. $6k$

Answer: D

Watch Video Solution

152. $\Delta = \begin{bmatrix} \frac{1}{a} & 1 & bc \\ \frac{1}{b} & 1 & ca \\ \frac{1}{c} & 1 & ab \end{bmatrix} =$

A. 0

B. abc

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

D. $a^2b^2c^2$

Answer: A

Watch Video Solution

153. If $\begin{bmatrix} x & 2 & x \\ x^2 & x & 6 \\ x & x & 6 \end{bmatrix} = ax^4 + bx^3 + cx^2 + dx + e,$ then $5a + 4b + 3c + 2d + e =$

A. 0

B. -16

C. 16

D. -11

Answer: D

Watch Video Solution

154. If ω is an imaginary cube root of unity then the value of

$$\begin{bmatrix} 1+\omega & \omega^2 & -\omega \\ 1+\omega^2 & \omega & -\omega^2 \\ \omega^2+\omega & \omega & -\omega^2 \end{bmatrix} =$$

A. 0

B. 2ω

C. $2\omega^2$

D. $-3\omega^2$

Answer: D

Watch Video Solution

155. If α, β, γ are the roots of $x^3 + ax^2 + b = 0$ then the value of

$$\begin{bmatrix} \alpha & \beta & \gamma \\ \beta & \gamma & \alpha \\ \gamma & \alpha & \beta \end{bmatrix}$$ is

A. $-a^3$

B. $a^3 - 3b$

C. a^3

D. $a^2 - 3b$

Answer: C

Watch Video Solution

156. The area of a triangle with vertices (-3,0),(3,0) and (0,k) is 9 sq. units . The value of k will be :

A. 9

B. 3

C. -9

D. 6

Answer: B

Watch Video Solution

157. The value of determinant

$$\begin{vmatrix} a-b & b+c & a \\ b-a & c+a & b \\ c-a & a+b & c \end{vmatrix}$$ is

A. $a^3 + b^3 + c^3$

B. 3bc

C. $a^3 + b^3 + c^3 - 3abc$

D. none of these

Answer: C

Watch Video Solution

158. If $\begin{bmatrix} 2x & 5 \\ 8 & x \end{bmatrix} = \begin{bmatrix} 6 & -2 \\ 7 & 3 \end{bmatrix}, then, x =$

A. 3

B. ± 3

C. ± 6

D. 6

Answer: C

Watch Video Solution

159. The number of distinct real roots of $\begin{bmatrix} \sin x & \cos x & \cos x \\ \cos x & \sin x & \cos x \\ \cos x & \cos x & \sin x \end{bmatrix} = 0$ in the interval $-\frac{\pi}{4} \leq x \leq \frac{\pi}{4}$ is

A. 0

B. 2

C. 1

D. 3

Answer: C

Watch Video Solution

160. There are two values of a which makes determinant , $A = \begin{vmatrix} 1 & -2 & 5 \\ 2 & a & -1 \\ 0 & 4 & 2a \end{vmatrix} = 86$, then sum of these numbers is :

A. 4

B. 5

C. -4

D. 9

Answer: C

Watch Video Solution

Watch Video Solution

161. The value of determinant $\begin{vmatrix} x & x+y & x+2y \\ x+2y & x & x+y \\ x+y & x+2y & x \end{vmatrix}$ is

A. $9x^2(x+y)$

B. $9y^2(x+y)$

C. $3y^2(x+y)$

D. $7x^2(x+y)$

Answer: B

Watch Video Solution

162. If x, y, z are all different and not equal to zero and

$\begin{vmatrix} 1+x & 1 & 1 \\ 1 & 1+y & 1 \\ 1 & 1 & 1+z \end{vmatrix}$ = 0 then the value of $x^{-1}+y^{-1}+z^{-1}$

is equal to

A. xyz

B. $x^{-1}y^{-1}z^{-1}$

C. $-x-y-z$

D. -1

Answer: D

Watch Video Solution

163. If A = $\begin{bmatrix} 2 & \lambda & -3 \\ 0 & 2 & 5 \\ 0 & 1 & 3 \end{bmatrix}$, then A^{-1} exists if :

A. $\lambda = 2$

B. $\lambda = -2$

C. $\lambda = 2$

D. none of these

Answer: D

Watch Video Solution

164. A root of the equation $\begin{vmatrix} 0 & x-a & x-b \\ x+a & 0 & x-c \\ x+b & x+c & 0 \end{vmatrix} = 0$ is

A. $f(a) = 0$

B. $f(b) = 0$

C. $f(0) = 0$

D. $f(1) = 0$

Answer: C

Watch Video Solution

165. The maximum value of $\Delta = \begin{vmatrix} 1 & 1 & 1 \\ 1 & 1+\sin\theta & 1 \\ 1+\cos\theta & 1 & 1 \end{vmatrix}$ is (θ is real number) :

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

B. $\frac{\sqrt{3}}{2}$

C. $\sqrt{2}$

D. $\frac{2\sqrt{3}}{4}$

Answer: A

Watch Video Solution

166. Let $f(t) = \begin{vmatrix} \cos t & t & 1 \\ 2\sin t & t & 2r \\ \sin t & t & t \end{vmatrix}$, then $\lim_{t \to 0} \frac{f(t)}{t^2}$ is equal to :

A. 0

B. -1

C. 2

D. 3

Answer: A

Watch Video Solution

167. If A,B and C are angles of a triangle, then the determinant :

$$\begin{vmatrix} -1 & \cos C & \cos B \\ \cos C & -1 & \cos A \\ \cos B & \cos A & -1 \end{vmatrix}$$ is equal to :

A. 0

B. -1

C. 1

D. none of these

Answer: A

Watch Video Solution

168. If A is a square matrix of order 3×3, then |KA| is equal to

A. $k|A|$

B. $k^2|A|$

C. $k^3|A|$

D. $3k|A|$

Answer: C

Watch Video Solution

169. Which of the following is correct

A. Determinant is a square matrix

B. Determinant is a number associated to a matrix

C. Determinant is a number associated to a square matrix

D. none of these

Answer: C

Watch Video Solution

170. If the area of the triangle with vertices (2,-6),(5,4) and (K,4) is 35 sq. units, then find the values of K, using determinants.

A. 12

B. -2

C. $-12-2$

D. $12-2$

Answer: D

Watch Video Solution

171. If $\Delta = \begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix}$ and A_ij is the cofactor of a_ij then the value of Δ is given by

A. $a_{11}A_{31} + a_12A_32 + a_{13}A_{33}$

B. $a_{11}A_{11} + a_{12}A_{12} + a_{13}A_{13}$

C. $a_{21}A_{11} + a_{22}A_{12} + a_{13}A_{13}$

D. $a_{11}A_{11} + a_{21}A_{21} + a_{31}A_{31}$

Answer: D

Watch Video Solution

172. If A is an invertible matrix of order 2 then find $|A^{-1}|$

A. $\det A$

B. $\frac{1}{\det A}$

C. 1

D. 0

Answer: B

Watch Video Solution

173. Let $A = \begin{bmatrix} 1 & \sin\theta & 1 \\ -\sin\theta & 1 & \sin\theta \\ -1 & -\sin\theta & 1 \end{bmatrix}$, where $0 \leq \theta \leq 2\pi$, then,

A. $\det(A) = 0$

B. $\det(A) \in (2, \infty)$

C. det(A) in (2, 4)

D. det(A) in [2, 4]

Answer: D

Watch Video Solution

174. If $A+B=\begin{bmatrix}1 & 0\\ 1 & 1\end{bmatrix}$ and $A-2B=\begin{bmatrix}-1 & 1\\ 0 & 1\end{bmatrix}$ then $A=$

A. $\left[\left[\frac{2}{3}, \frac{1}{3}\right], \left[\frac{2}{3}, \frac{1}{3}\right]\right]$

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

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

D. none of these

Answer: A

Watch Video Solution

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

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

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

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

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

Answer: B

Watch Video Solution

176. Choose the correct answer

A. Every scalar matrix is an identity matrix

B. Every identity matrix' is a scalar matrix

C. Every diagonal matrix is an identity matrix

D. A square matrix whose each element is 1 is an identity matrix

Answer: B

Watch Video Solution

177. For how many values of x in the closed interval $[-4, -1]$ the matrix $\begin{bmatrix} 3 & -1+x & 2 \\ 3 & -1 & x+2 \\ x+3 & -1 & 2 \end{bmatrix}$ is singular?

A. 2

B. 0

C. 3

D. 1

Answer: C

Watch Video Solution

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

A. does not exist

B. [[-2 , 4],[-3 ,6]]

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

D. [[1, 2],[-3/2 ,3]]

Answer: A

Watch Video Solution

179. If A and B are square matrices of the same order, then show that $(AB)^{-1} = B^{-1}A^{-1}$.

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

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

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

D. AB^{-1}

Answer: A

Watch Video Solution

180. The inverse of the matrix $\begin{bmatrix} 1 & -2 \\ 3 & 4 \end{bmatrix}$ is

A. $\frac{1}{10}\begin{bmatrix} 1 & -2 \\ 3 & 4 \end{bmatrix}$

B. $\frac{1}{10}\begin{bmatrix} 4 & 2 \\ -3 & 1 \end{bmatrix}$

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

D. $\frac{1}{10}\begin{bmatrix} 4 & -2 \\ -3 & 1 \end{bmatrix}$

Answer: B

Watch Video Solution

181. Inverse of the matrix $\begin{bmatrix} \cos 2\theta & -\sin 2\theta \\ \sin 2\theta & \cos 2\theta \end{bmatrix}$ is

A. $\begin{bmatrix} \cos 2\theta & -\sin 2\theta \\ \sin 2\theta & \cos 2\theta \end{bmatrix}$

B. $\begin{bmatrix} \cos 2\theta & \sin 2\theta \\ \sin 2\theta & -\cos 2\theta \end{bmatrix}$

C. $\begin{bmatrix} \cos 2\theta & \sin 2\theta \\ \sin 2\theta & \cos 2\theta \end{bmatrix}$

D. $\begin{bmatrix} \cos 2\theta & \sin 2\theta \\ -\sin 2\theta & \cos 2\theta \end{bmatrix}$

Answer: D

Watch Video Solution

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

A. none of these

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

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

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

Answer: A

Watch Video Solution

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

A. $\begin{bmatrix} 8 & 5 \\ -5 & 3 \end{bmatrix}$

B. $\begin{bmatrix} 8 & -5 \\ -5 & 3 \end{bmatrix}$

C. $\begin{bmatrix} 8 & -5 \\ 5 & 3 \end{bmatrix}$

D. $\begin{bmatrix} 8 & -5 \\ -5 & -3 \end{bmatrix}$

Answer: A

Watch Video Solution

184. If $A_{\theta} = \begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$ then $A_{\alpha}A_{\beta}$ equals :

A. $A(\alpha_1\alpha_2)$

B. $A(\alpha_1 + \alpha_2)$

C. $A(\alpha_2 - \alpha_1)$

D. $A(\alpha_1 - \alpha_2)$

Answer: B

Watch Video Solution

185. If $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$ then $A^2 =$

A. A

B. $2A$

C. $2A$

D. $3A$

Answer: D

Watch Video Solution

186. If $A = \begin{bmatrix} 2 & -1 \\ 0 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} -3 \\ 4 \end{bmatrix}$ then $AB =$

A. $\begin{bmatrix} -10 \\ 7 \end{bmatrix}$

B. $\begin{bmatrix} -10 & 7 \end{bmatrix}$

C. $\begin{bmatrix} -10 & 4 \end{bmatrix}$

D. $\begin{bmatrix} -10 \\ 4 \end{bmatrix}$

Answer: D

Watch Video Solution

187. If $\begin{bmatrix} x+y \\ x-y \end{bmatrix} = \begin{bmatrix} 2 & 1 \\ 4 & 3 \end{bmatrix} \begin{bmatrix} 1 \\ -2 \end{bmatrix}$ then (x,y)

A. 1)(-1,1)

B. 2)(1,-1)

C. 3)(1,1)

D. 4)(2,1)

Answer: C

Watch Video Solution

188. If $A = \begin{bmatrix} \sin\theta & \cos\theta \\ -\cos\theta & -\sin\theta \end{bmatrix}$ then $A^2 =$

A. $\begin{bmatrix} \cos 2\theta & \sin 2\theta \\ -\sin 2\theta & -\cos 2\theta \end{bmatrix}$

B. $\begin{bmatrix} -\cos 2\theta & \sin 2\theta \\ \sin 2\theta & -\cos 2\theta \end{bmatrix}$

C. $\begin{bmatrix} -\cos 2\theta & \sin 2\theta \\ -\sin 2\theta & \cos 2\theta \end{bmatrix}$

D. $\begin{bmatrix} -\cos 2\theta & 0 \\ 0 & -\cos 2\theta \end{bmatrix}$

Answer: D

Watch Video Solution

189. If the order of the matrix $A = 4 \times 3$, the order of $B = 4 \times 5$ and the order of C is 7×3, then the order of $\left(A' \times B\right)'$x C' is

A. 1)4×5

B. 2)3×7

C. 3)4×3

D. 4)5×7

Answer: D

Watch Video Solution

190. $\begin{bmatrix} x-y & 8 \\ x+y & 9 \end{bmatrix} = \begin{bmatrix} 2 & 8 \\ 4 & 9 \end{bmatrix}$, then (x, y)

A. a.$(3, 1)$

B. b.$(-3, -1)$

C. c.$(-1, 3)$

D. d.$(-1, -3)$

Answer: A

Watch Video Solution

191. Let $A = \begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix}$. Then $A^n =$

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

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

C. $\begin{bmatrix} 1 & 2^n \\ 0 & 1 \end{bmatrix}$,

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

Answer: A

Watch Video Solution

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

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

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

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

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

Answer: A

Watch Video Solution

193. If $\begin{bmatrix} x & 1 \\ -1 & -y \end{bmatrix} + \begin{bmatrix} y & 1 \\ 3 & x \end{bmatrix} = \begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$, then (x,y) =

A. (1,0)

B. (1,1)

C. (0,1)

D. (4,2)

Answer: A

Watch Video Solution

194. If A and B are two square matrices of same order then $(AB)' =$

A. $B'A'$

B. A' B'

C. AB'

D. $A'B$

Answer: B

Watch Video Solution

195. If $A = \begin{bmatrix} 3 & 5 \\ 2 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 17 \\ 0 & -10 \end{bmatrix}$ then $|AB|$ is equal to

_____

A. -110

B. 92

C. 80

D. 100

Answer: D

Watch Video Solution

196. The matrix $\begin{bmatrix} 0 & 5 & -7 \\ -5 & 0 & 11 \\ 7 & -11 & 0 \end{bmatrix}$ is known as

A. symmetric matrix

B. diagonal matrix

C. upper triangular matrix

D. skew symmetric matrix

Answer: D

Watch Video Solution

197. If in a square matrix $A = (a_{ij})$ we have $a_{ji} = a_{ij}$ for all i,j then A is

A. symmetric matrix

B. triangular matrix

C. transpose matrix

D. skew symmetric matrix

Answer: A

Watch Video Solution

198. If $A=\begin{bmatrix}4 & x+2\\ 2x-3 & x-1\end{bmatrix}$ is symmetric then$x=$

A. 3

B. 5

C. 2

D. 4

Answer: B

Watch Video Solution

199. If A is a square matrix then $A.\ A^T$ is

A. symmetric

B. skew symmetric

C. a scalar matrix

D. a unit matrix

Answer: A

Watch Video Solution

200. If $A+B=\begin{bmatrix}1&0\\1&1\end{bmatrix}$ and $A-2B=\begin{bmatrix}-1&1\\0&1\end{bmatrix}$ then $A=$

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

B. [[1, 1],[2,1]]

C. $A + B =$ [[(2)/(3),(1)/(3)],[(2)/(3), (1)/(3)]]`

D. none of these

Answer: A

Watch Video Solution

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

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

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

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

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

Answer: B

Watch Video Solution

202. If $A = \begin{bmatrix} 1 & -3 \\ 2 & k \end{bmatrix}$ and $A^2 - 4A + 10I = A$, then k =

A. -4

B. 0

C. 1 or 4

D. 4 and not 1

Answer: D

Watch Video Solution

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

A. $\begin{bmatrix} 8 & 1 & 2 \\ -1 & 10 & -1 \end{bmatrix}$

B. $\begin{bmatrix} 8 & -1 & 2 \\ -1 & 10 & -1 \end{bmatrix}$

C. $\begin{bmatrix} 8 & 1 & 2 \\ 1 & 10 & 1 \end{bmatrix}$

D. $\begin{bmatrix} 8 & 1 & -2 \\ -1 & 10 & -1 \end{bmatrix}$

Answer: A

Watch Video Solution

204. If $O(A) = 2 \times 3, O(B) = 3 \times 2,$ and $O(C) = 3 \times 3$ which one of the following is not defined ?

A. BAC

B. $CB + A'$

C. $C. (A + B)$

D. $C(A + B)'$

Answer: C

Watch Video Solution

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

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

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

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

D. $\begin{bmatrix} 8 & 0 & 0 \\ 0 & 8 & 0 \\ 0 & 0 & 8 \end{bmatrix}$

Answer: D

Watch Video Solution

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

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

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

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

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

Answer: D

Watch Video Solution

207. Given below are atomic radii of same elements of second period.

Element	B	O	N	C
Atomic Radii in pm	88	66	74	77

Arrange these elements in the increasing order of their atomic number. Give reason for your answer.

A. 0

B. 130

C. 22

D. 5

Answer: A

Watch Video Solution

208. $\begin{vmatrix} 3421 & 3422 \\ 3423 & 3424 \end{vmatrix} =$

A. -2

B. 1

C. 0

D. 3

Answer: A

Watch Video Solution

209. Let $A = \begin{bmatrix} 200 & 50 \\ 10 & 2 \end{bmatrix} B = \begin{bmatrix} 50 & 40 \\ 2 & 3 \end{bmatrix}$. Then the value of the determinant of the product AB is

A. 460

B. 2000

C. -7000

D. 3000

Answer: C

Watch Video Solution

210. If k is a scalar and A is a n -square matrix, then $|kA| =$

A. 1)$k|A|^2$

B. $2)k|A|$

C. $3)k^n|A|^n$

D. $4)k^n|A|$

Answer: D

Watch Video Solution

211. The value of $\begin{vmatrix} 2 & 3 & 1 \\ -3 & -1 & -4 \\ -2 & -5 & -3 \end{vmatrix} =$

A. -44

B. 44

C. 34

D. none of these

Answer: D

Watch Video Solution

212. $\begin{vmatrix} 4\sin^2\theta & \cos 2\theta \\ -\cos 2\theta & \cos^2\theta \end{vmatrix} =$

A. $8\sin^2\theta\cos^2\theta$

B. $4\sin 2\theta\cos 2\theta$

C. 1

D. $4\cos^3\theta - 3\cos\theta$

Answer: C

Watch Video Solution

213. $\begin{vmatrix} x & 4 & y+z \\ y & 4 & z+x \\ z & 4 & x+y \end{vmatrix} =$

A. 4

B. $x + y + z$

C. xyz

D. 0

Answer: D

Watch Video Solution

214. Prove that $\begin{vmatrix} b+c & a & a \\ b & c+a & b \\ c & c & a+b \end{vmatrix} = 4ac$

A. 0

B. $a + b + c$

C. $4abc$

D. abc

Answer: C

Watch Video Solution

215. The value of $\begin{vmatrix} 1 & 1 & 1 \\ bc & ca & ab \\ b+c & c+a & a+b \end{vmatrix}$

A. 1

B. 0

C. $(a-b)(b-c)(c-a)$

D. $(a+b)(b+c)(c+a)$

Answer: C

Watch Video Solution

216. Using the property of determinants and without expanding $\begin{bmatrix} a-b & b-c & c-a \\ b-c & c-a & a-b \\ c-a & a-b & b-c \end{bmatrix} = 0$

A. 0

B. $c - b$

C. $a^2 + b^2 + c^2$

D. none of these

Answer: A

Watch Video Solution

217. The value of $\begin{vmatrix} 2 & 1 & 1 \\ 1 & 2 & 1 \\ 1 & 1 & 2 \end{vmatrix} =$

A. 0

B. 3

C. -3

D. 4

Answer: D

Watch Video Solution

218. $\begin{vmatrix} x & 4 & y+z \\ y & 4 & z+x \\ z & 4 & x+y \end{vmatrix} =$

A. $1+x+y+z$

B. $x+y+z$

C. 0

D. none of these

Answer: C

Watch Video Solution

219. $\begin{vmatrix} 1 & x & x^2 \\ 1 & y & y^2 \\ 1 & z & z^2 \end{vmatrix} =$

A. 0

B. $(x-y)(y-z)(z-x)$

C. $(y-x)(y-z)(z-x)$

D. none of these

Answer: B

Watch Video Solution

220. $\begin{vmatrix} a & b & c \\ b & c & a \\ c & a & b \end{vmatrix} =$

A. $a+b+c+abc$

B. $a^2+b^2+c^2+ab+bc+ca$

C. $3abc - a^3 - b^3 - c^3$

D. $a^3 + b^3 + c^3 - 3abc$

Answer: C

Watch Video Solution

221. $\begin{vmatrix} 1 & a & a^2 - bc \\ 1 & b & b^2 - ca \\ 1 & c & c^2 - ab \end{vmatrix} =$

A. 1)0

B. 2)abc

C. 3)4abc

D. 4)$2\begin{bmatrix} 1 & a & a^2 \\ 1 & b & b^2 \\ 1 & c & c^2 \end{bmatrix}$

Answer: A

Watch Video Solution

222. $\begin{vmatrix} b^2c^2 & bc & b+c \\ c^2a^2 & ca & c+a \\ a^2+b^2 & ab & a+b \end{vmatrix} =$

A. 0

B. $ab+bc+ca$

C. abc

D. $a^2b^2c^2$

Answer: A

Watch Video Solution

223. If $\begin{vmatrix} x+1 & 2 & 3 \\ 1 & x+2 & 3 \\ 1 & 2 & x+3 \end{vmatrix} = 0$, then $x = 0$ and

A. $x = -6$

B. $x = 6$

C. $x = 4$

D. $x = 2$

Answer: A

Watch Video Solution

224. The factors of $\begin{vmatrix} x & a & b \\ a & x & b \\ a & b & x \end{vmatrix}$ are

A. $x - a$, $x - b$ and $x + a + b$

B. $x + a$, $x + b$ and $x + a + b$

C. $x + a$, $x + b$ and $x - a - b$

D. $x - a$, $x - b$ and $x - a - b$

Answer: A

Watch Video Solution

225. If $\begin{vmatrix} 1 & 2 & 3 \\ 2 & x & 3 \\ 3 & 4 & 5 \end{vmatrix} = 0$ then x=

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

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

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

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

Answer: A

Watch Video Solution

226. The roots of the equation $\begin{vmatrix} 0 & x & 16 \\ x & 5 & 7 \\ 0 & 9 & x \end{vmatrix} = 0$ are

A. (0,9,16)

B. (0,12,-12)

C. (0,12,12)

D. (0,12,16)

Answer: B

Watch Video Solution

227. The roots of the equation

$$\begin{vmatrix} 2+x & 3 & -4 \\ 2 & 3+x & -4 \\ 2 & 3 & -4+x \end{vmatrix} = 0 \text{ are}$$

A. (0,1)

B. (0,2)

C. (0,-1)

D. (0,-2)

Answer: C

Watch Video Solution

228. A root of the equation $\begin{vmatrix} 0 & x-a & x-b \\ x+a & 0 & x-c \\ x+b & x+c & 0 \end{vmatrix} = 0$ is

A. 1

B. 2

C. 0

D. 1

Answer: C

Watch Video Solution

229. The roots of the equation $\begin{vmatrix} x-1 & 1 & 1 \\ 1 & x-1 & 1 \\ 1 & 1 & x-1 \end{vmatrix} = 0$ are

A. 1,2

B. $-1, 2$

C. $1, \ -2$

D. $-1, \ -2$

Answer: B

Watch Video Solution

230. If $a+b+c=0$, one root of :

$\begin{vmatrix} a-x & c & d \\ c & b-x & a \\ b & a & c-x \end{vmatrix} = 0$ is :

A. $x=1$

B. $x = 2$

C. $x = a^2 + b^2 + c^2$

D. $x = 0$

Answer: D

Watch Video Solution

231. The non zero value of x, if $\begin{vmatrix} -x & 1 & 0 \\ 1 & -x & 1 \\ 0 & 1 & -x \end{vmatrix} = 0$ is

A. ± 1

B. $\pm\sqrt{2}$

C. $\pm\sqrt{3}$

D. $\sqrt{2}, \sqrt{3}$

Answer: B

Watch Video Solution

232. The factors of $\begin{vmatrix} 1 & 1 & 1 \\ x & y & 1 \\ x^2 & y^2 & 1 \end{vmatrix}$ are

A. $x-1, y-1$ and $y-x$

B. $x-1, y-1$ and $x+y$

C. x, y and $x-y$

D. $x-1, y+1$ and $x+y$

Answer: A

Watch Video Solution

233. The factors of $\begin{vmatrix} x & a & b \\ a & x & b \\ a & b & x \end{vmatrix}$ are

A. $x-a, x-b$ and $x+a+b$

B. $x+a, x+b$ and $x+a+b$

C. $x+a, x+b$ and $x-a-b$

D. $x-a, x-b$ and $x-a-b$

Answer: A

Watch Video Solution

234. If α, β and $\gamma$are roots of the equations $x^3+px+q=0$ then the value of det : $\begin{bmatrix}\alpha & \beta & \gamma \\ \beta & \gamma & \alpha \\ \gamma & \alpha & \beta\end{bmatrix}$ is

A. $(x-\alpha)(x-\beta)(x-\gamma)$

B. $x\alpha\beta\gamma lmn$

C. $(x+\alpha)(x+\beta)(x+\gamma)$

D. $(x-l)(x-m)(x-n)$

Answer: A

Watch Video Solution

235. $\begin{vmatrix} 1^2 & 2^2 & 3^2 & 4^2 \\ 2^2 & 3^2 & 4^2 & 5^2 \\ 3^2 & 4^2 & 5^2 & 6^2 \\ 4^2 & 5^2 & 6^2 & 7^2 \end{vmatrix}$

A. 1)618

B. 2)36

C. 3)12

D. 4)0

Answer: D

Watch Video Solution

236. The value of $\begin{bmatrix} a & b & c & d \\ -a & b & c & d \\ -a & -b & c & d \\ -a & -b & -c & d \end{bmatrix}$ is

A. $-8abcd$

B. abcd

C. $4abcd$

D. $6abcd$

Answer: A

Watch Video Solution

237. If A is a square matrix of order 3 and $|A|=8$, then $|adjA|$=

A. 8

B. 8^2

C. 8^3

D. $\frac{1}{8}$

Answer: B

Watch Video Solution

238. The value of $\begin{vmatrix} x+y & y+z & z+x \\ x & y & z \\ x-y & y-z & z-x \end{vmatrix} =$

A. $2(x+y+z)^3$

B. $2(x+y+z)^2$

C. 0

D. $(x+y+z)^3$

Answer: C

Watch Video Solution

239. The value of $\begin{bmatrix} x & p & q \\ p & x & q \\ p & q & x \end{bmatrix}$ is

A. $(x-p)(x-q)(x+p+q)$

B. $x(x-p)(x-q)$

C. $pq(x-p)(x-q)$

D. $(p-q)(x-p)(x-q)$

Answer: A

Watch Video Solution

240. If 3^n is a factor of the determinant

$\begin{bmatrix} 1 & 1 & 1 \\ nC_1 & (n+3)C_1 & (n+6)C_1 \\ nC_2 & (n+3)C_2 & (n+6)C_2 \end{bmatrix}$ then the maximum value of n is

A. 5

B. 2

C. 3

D. 4

Answer: C

Watch Video Solution

241. The determinant:

$$\begin{vmatrix} xp+y & x & y \\ yp+z & y & z \\ 0 & xp+y & yp+z \end{vmatrix} = 0 \text{ if :}$$

A. x, y, z are in A.P

B. x, y, z are in G.P.

C. x, y, z` are in H.P

D. xy, yz, zx are in A.P

Answer: B

Watch Video Solution

242. If $f(x) = \begin{bmatrix} 1 & x & x+1 \\ 2x & x(x-1) & (x+1)x \\ 3x(x-1) & x(x-1)(x-2) & (x+1)x(x-1) \end{bmatrix}$

then $f(200)$ is

A. 0

B. 1

C. 200

D. -200

Answer: A

Watch Video Solution

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

A. 5

B. -1

C. 11

D. no real value of α

Answer: D

Watch Video Solution

244. If $A = \begin{bmatrix} a & b \\ b & a \end{bmatrix} A^2 = \begin{bmatrix} \alpha & \beta \\ \beta & a \end{bmatrix}$ then

A. $\alpha = 2ab, , \beta = a^2 + b^2$

B. $\alpha = a^2 + b^2, \beta = ab$

C. $\alpha = a^2 + b^2, \beta = 2ab$

D. alpha=a^(2)+b^(2), beta=a^(2)-b^(2)`

Answer: C

Watch Video Solution

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

A. 2

B. -1

C. -2

D. 5

Answer: D

Watch Video Solution

Watch Video Solution

246. Let $A = \begin{bmatrix} 0 & 0 & -1 \\ 0 & -1 & 0 \\ -1 & 0 & 0 \end{bmatrix}$. The only correct statement about the matrix A is

A. 1)A^{-1} does not exist

B. 2)$A = (-1)I$ where I is the unit matrix

C. 3)A is a zero matrix

D. 4)$A^2 = I$

Answer: D

Watch Video Solution

247. If A+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. Either A or B is a zero matrix

B. $A = B$

C. $AB = BA$

D. neither A nor B is a zero matrix

Answer: C

Watch Video Solution

248. Let $A = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$ and $B = \begin{pmatrix} a & 0 \\ 0 & b \end{pmatrix}$, $ab \in N$. Then :

A. There are infinitely many B' 's such that $AB = BA$

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

C. there exists more than one but finite number of B 's such that

$AB = BA$

D. there exists exactly one B such that $AB - BA$

Answer: A

Watch Video Solution

249. Let $A = \begin{bmatrix} 5 & 5\alpha & \alpha \\ 0 & \alpha & 5\alpha \\ 0 & 0 & 5 \end{bmatrix} |A^2| = 25, \text{ then } |\alpha| =$

A. a)1

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

C. c)1

D. d)5^2

Answer: B

Watch Video Solution

250. Let $A = \begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix}$. Then $A^n =$

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

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

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

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

Answer: A

Watch Video Solution

251. If $\begin{bmatrix} 2+x & 3 & 4 \\ 1 & -1 & 2 \\ x & 1 & -5 \end{bmatrix}$ is singular matrix then x is

A. $\frac{13}{25}$

B. $-\frac{25}{13}$

C. $\frac{5}{13}$

D. $\frac{25}{13}$

Answer: B

Watch Video Solution

252. For the matrix $A = \begin{bmatrix} 1 & 1 & 0 \\ 1 & 2 & 1 \\ 2 & 1 & 0 \end{bmatrix}$ which is correct?

A. $A^3 + 3A^2 - I = 0$

B. $A^3 - 3A^2 - I = 0$

C. $A^3 + 2A^2 - I = 0$

D. $A^3 - A^2 + I = 0$

Answer: B

Watch Video Solution

253. If $A^2 - A + I = O$, then the inverse of A is :

A. A^{-2}

B. $A + I$

C. $I - A$

D. $A - I$

Answer: C

Watch Video Solution

254. If $P = \begin{bmatrix} i & 0 & -i \\ 0 & -i & i \\ -i & i & 0 \end{bmatrix}, Q = \begin{bmatrix} -i & i \\ 0 & 0 \\ i & -i \end{bmatrix}$ then $PQ =$

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

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

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

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

Answer: B

Watch Video Solution

255. If $A = \begin{bmatrix} 2 & -1 \\ -1 & 2 \end{bmatrix}$ and I is the unit matrix of order 2 , then A^2 is equal to

A. $3A - 4I$

B. $A + I$

C. $4A - 3I$

D. $A - I.$

Answer: A

Watch Video Solution

256. Let $X = \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}$, $A = \begin{bmatrix} 1 & -1 & 2 \\ 2 & 0 & 1 \\ 3 & 2 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 3 \\ 1 \\ 4 \end{bmatrix}$ and if $AX = B$, then X.

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

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

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

D. 4) $\begin{bmatrix} -1 \\ 2 \\ 5 \end{bmatrix}$

Answer: D

Watch Video Solution

257. Let $X=\begin{bmatrix}x\\y\\z\end{bmatrix}$, $D=\begin{bmatrix}3\\5\\11\end{bmatrix}$, A= $\begin{bmatrix}1&-1&2\\2&1&1\\4&-1&-2\end{bmatrix}$. If $X=A^{-1}D$

,

then X=

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

B. $\begin{bmatrix}\frac{8}{3}\\-\frac{1}{3}\\0\end{bmatrix}$

C. $\begin{bmatrix}\frac{8}{3}\\1\\0\end{bmatrix}$

D. $\begin{bmatrix}\frac{8}{3}\\\frac{1}{3}\\-1\end{bmatrix}$

Answer: B

Watch Video Solution

258. If $X = \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$, then X^n, for $n \in N$ is equal to

A. $2^{n-1}. X$

B. $n^2 X$

C. nX

D. $2^{n+1}. X$

Answer: A

Watch Video Solution

259. Let A and B be two square matrices such that $AB = A$ and $BA = B$, then $A^2 =$

A. b

B. A

C. I

D. 0

Answer: B

Watch Video Solution

260. If $A = \begin{bmatrix} \cos x & \sin x & 0 \\ -\sin x & \cos x & 0 \\ 0 & 0 & 1 \end{bmatrix} = f(x)$ then $A^{-1} =$

A. $f(-x)$

B. $f(x)$

C. $-f(x)$

D. $-f(-x)$

Answer: A

Watch Video Solution

261. A nonsingular matrix A satisfies $A^2 - A + 2I = 0$, then $A^{-1} =$

A. $I - A$

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

C. $I + A$

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

Answer: B

Watch Video Solution

262. If $\begin{bmatrix} x & y^3 \\ 2 & 0 \end{bmatrix} = \begin{bmatrix} 1 & 8 \\ 2 & 0 \end{bmatrix}$ then $\begin{bmatrix} x & y \\ 2 & 0 \end{bmatrix}^{-1} =$

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

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

C. $\begin{bmatrix} 0 & -8 \\ -2 & 1 \end{bmatrix}$

D. $\begin{bmatrix} 0 & \frac{1}{2} \\ \frac{1}{2} & -\frac{1}{4} \end{bmatrix}$

Answer: D

Watch Video Solution

263. If the matrix $\begin{bmatrix} \cos\theta & \sin\theta & 0 \\ \sin\theta & \cos\theta & 0 \\ 0 & 0 & 1 \end{bmatrix}$ is singular then $\theta =$

A. π

B. $\frac{\pi}{2}$

C. $\frac{\pi}{3}$

D. $\frac{\pi}{4}$

Answer: D

Watch Video Solution

264. If $A = \begin{bmatrix} 1 & 3 \\ 2 & 1 \end{bmatrix}$, then determinant of $A^2 - 2A$ is

A. 5

B. 25

C. -5

D. -25

Answer: B

Watch Video Solution

265. If A and B are two matrices such that $B = -A^{-1}BA$ then $(A+B)^2 =$

A. 0

B. $A^2 + B^2$

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

D. $A + B$

Answer: B

Watch Video Solution

266. If $A = \begin{bmatrix} 0 & 2 \\ 3 & -4 \end{bmatrix}, kA = \begin{bmatrix} 0 & 3a \\ 2b & 24 \end{bmatrix}$ then the value of k, a, b are respectively

A. $-6, -12, -18$

B. $-6, 4, 9$

C. $-6, -4, -9$

D. $-6, 12, 18$

Answer: C

Watch Video Solution

267. If A and B are square matrices of order 3, A is nonsingular and $A.\ B = O,$ then B is

A. null matrix

B. non singular matrix

C. singular matrix

D. unit matrix

Answer: C

Watch Video Solution

268. adj $\begin{bmatrix} 1 & 0 & 2 \\ -1 & 1 & -2 \\ 0 & 2 & 1 \end{bmatrix} = \begin{bmatrix} 5 & a & -2 \\ 1 & 1 & 0 \\ -2 & -2 & b \end{bmatrix}$ then $(a, b) =$

A. (-4,1)

B. (-4,-1)

C. (4,1)

D. (4,-1)

Answer: C

Watch Video Solution

269. $A = \begin{bmatrix} -1 & 0 \\ 0 & 2 \end{bmatrix}$ then $A^3 - A^2 =$

A. 2A

B. 2I

C. A

D. I

Answer: A

Watch Video Solution

270. If A and B are square matrices of the same order, then

A. $A+B=B+A$

B. $A+B=A-B$

C. $A-B=B-A$

D. $AB=BA$

Answer: A

Watch Video Solution

271. If $A=\begin{bmatrix}2&1&0\\0&2&1\\1&0&2\end{bmatrix}$ then $|\text{adj } A|=$

A. $\frac{1}{9}$

B. 81

C. 0

D. 9

Answer: B

Watch Video Solution

272. If A and B are square matrices of the same order such that $(A+B)(A-B)=A^2-B^2$, then $(ABA)^2=$

A. A^2B^2

B. A^2

C. B^2

D. I

Answer: C

Watch Video Solution

273. If A is a 3×3 nonsingular matrix and if $|A| = 3$, then $\left|(2A)^{-1}\right| =$

A. $\frac{1}{24}$

B. $\frac{1}{3}$

C. 3

D. 24

Answer: A

Watch Video Solution

274. If $A = \begin{bmatrix} 3 & 2 \\ 1 & 1 \end{bmatrix}$ then $A^2 + xA + yI = 0$ for (x,y) =

A. (1,3)

B. (4,-1)

C. (-1,3)

D. (-4,1)

Answer: D

Watch Video Solution

275. If $\begin{bmatrix} 1 & 2 & -1 \\ 1 & x-2 & 1 \\ x & 1 & 1 \end{bmatrix}$ is singular ,then the value of x is

A. 2

B. 3

C. 1

D. 0

Answer: A

Watch Video Solution

276. If A and B are symmetric matrices of the same order, then which one of the following is NOT true

A. $A+B$ is symmetric

B. $A-B$ is symmetric

C. $AB+BA$ is symmetric

D. $AB-BA$ is symmetric

Answer: D

Watch Video Solution

277. If $\begin{pmatrix} 1 & -\tan\theta \\ \tan\theta & 1 \end{pmatrix}\begin{pmatrix} 1 & \tan\theta \\ -\tan\theta & 1 \end{pmatrix}^{-1} = \begin{pmatrix} a & -b \\ b & a \end{pmatrix}$ then :

A. $a=1=b$

B. $a=\cos 2\theta, b=\sin 2\theta$

C. $a = \sin 2\theta, b = \cos 2\theta$

D. $a \cos \theta, b \sin \theta$

Answer: B

Watch Video Solution

278. If A (adj .A) = 5I , where I is idensity martrix of order 3 , then |adj A | =

A. 125

B. 25

C. 10

D. 5

Answer: B

Watch Video Solution

279. If $A = \begin{bmatrix} 3 & 2 \\ 4 & 5 \end{bmatrix}$ and $AC = \begin{bmatrix} 19 & 24 \\ 37 & 46 \end{bmatrix}, then$C=`

A. $\begin{bmatrix} 3 & 4 \\ 5 & 2 \end{bmatrix}$

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

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

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

Answer: C

Watch Video Solution

280. If $A = (a_{ij})$ is a scalar matrix of order $n \times n$ such that $a_{ii} = k$ for all i, then trace of A is equal to

A. nk

B. $n + k$

C. $\frac{n}{k}$

D. none of these

Answer: A

Watch Video Solution

281. Let A be an invertible matrix, which of the following is not true?

A. $(A')^{-1} = (A^{-1})'$

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

C. $(A^2)^{-1} = (A^{-1})^2$

D. $|A^{-1}| = |A|^{-1}$

Answer: B

Watch Video Solution

282. If the matrix A B is a zero matrix, then

A. It is not necessary that either $A = O$ or $B = O$

B. $A = O$ or $B = O$

C. $A = O$ and $B = O$

D. All the above statement are wrong

Answer: A

Watch Video Solution

283. The value of x for which the matrix product

$\begin{bmatrix} 2 & 0 & 7 \\ 0 & 1 & 0 \\ 1 & -2 & 1 \end{bmatrix} \begin{bmatrix} -x & 14x & 7x \\ 0 & 1 & 0 \\ x & -4x & -2x \end{bmatrix}$ equals an identity matrix is

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

B. $\frac{1}{3}$

C. $\frac{1}{4}$

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

Answer: D

Watch Video Solution

284. A square matrix can always be expressed as

A. 1)the sum of a symmetric and a skew symmetric matrix

B. 2)the sum of a diagonal matrix and a symmetric matrix

C. 3)a skew symmetric matrix

D. 4)a skew matrix

Answer: A

Watch Video Solution

285. If $AB = A$ and $BA = B$, then $B^2 =$

A. B

B. A

C. I

D. O

Answer: A

Watch Video Solution

286. If $A = \begin{bmatrix} i & 0 \\ 0 & i \end{bmatrix}$ then $A^{4n}(n \in N)$ equals :

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. $\begin{bmatrix} 0 & i \\ i & 0 \end{bmatrix}$

Answer: C

Watch Video Solution

287. If $A = \begin{pmatrix} a & b \\ c & d \end{pmatrix}$, such that $ad - bc \neq 0$ then A^{-1} is :

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

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

C. $\begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$

D. none of these

Answer: A

Watch Video Solution

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

A. $\begin{bmatrix} -d & -b \\ -c & a \end{bmatrix}$

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

C. $\begin{bmatrix} d & b \\ c & a \end{bmatrix}$

D. $\begin{bmatrix} d & c \\ b & a \end{bmatrix}$

Answer: B

Watch Video Solution

289. If $A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ a & b & -1 \end{bmatrix}$ then $A^2 =$

A. a null matrix

B. a unit matrix

C. $-A$

D. A

Answer: B

Watch Video Solution

290. If $A = \begin{bmatrix} \cos x & \sin x \\ -\sin x & \cos x \end{bmatrix}$ and $A(adjA) = k\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ then the value of k is

A. $\sin x \cos x$

B. I

C. 2

D. 3

Answer: B

Watch Video Solution

291. If A is 3×4 matrix and B is a matrix such that $A^1 B$ and BA^1 are both defined, then B is of the type

A. 3×4

B. 3×3

C. 4×4

D. 4×3

Answer: A

Watch Video Solution

292. If $A = \begin{bmatrix} 1 & x \\ x^2 & 4y \end{bmatrix}$, $B = \begin{bmatrix} -3 & 1 \\ 1 & 0 \end{bmatrix}$ and adj $A + B = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, then the value of x and y are respectively

A. (1,1)

B. $(-1, 1)$

C. (1,0)

D. none of these

Answer: A

Watch Video Solution

293. Let $A = \begin{bmatrix} 1 & 2 \\ -5 & 1 \end{bmatrix}$ and $A^{-1} = xA + yI,$ then the values of x and y are

A. $x = -\frac{1}{11}, y = \frac{2}{11}$

B. $x = -\frac{1}{11}, y = -\frac{2}{11}$

C. $x = \frac{1}{11}, y = \frac{2}{11}$

D. $x = \frac{1}{11}, y = \frac{2}{11}$

Answer: A

Watch Video Solution

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

A. 1

B. 4

C. -1

D. none of these

Answer: D

Watch Video Solution

295. If $A = \begin{bmatrix} \alpha & 2 \\ 2 & \alpha \end{bmatrix}$ and $|A^3| = 125$ then $\alpha =$

A. ± 1

B. ± 2

C. ± 3

D. ± 5

Answer: C

Watch Video Solution

296. If $A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 1 \\ 0 & -2 & 4 \end{bmatrix}$ and also $A^{-1} = \frac{1}{6}\left(A^2 + cA + dI\right)$, where I is unit matrix , then the ordered pair (c,d) is :

A. (-6,11)

B. (-11,6)

C. (11,6)

D. (6,11)

Answer: A

Watch Video Solution

297. Let A and B be 3×3 matrices of real numbers, where A is symmetric and B skew symmetric and $(A+B)(A-B)=(A-B)(A+B)$. If $(AB)'=(-1)^n AB$ then,

A. $n \in Z$

B. $n \in N$

C. n is an even natural number

D. n is an odd natural number

Answer: D

Watch Video Solution

298. If $A=\begin{bmatrix}1 & 0\\ 1 & 1\end{bmatrix}$ and $I=\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}$, then which one of the following holds for all $n \geq 1$ by the principle of mathematical induction :

A. $A^n = 2^{n-1}A + (n-1)I$

B. $A^n = nA + (n-1)I$

C. $A^n = 2^{n-1}A - (n-1)I$

D. $A^n = nA - (n-1)I$

Answer: D

Watch Video Solution

299. If $AB = A$ and $BA = B$, then $B^2 =$

A. $B^2 = B$ and $A^2 = A$

B. $B^2 \neq B$ and $A^2 = A$

C. $A^2 \neq A$ and $B^2 = B$

D. $A^2 \neq A$ and $B^2 \neq B$

Answer: A

Watch Video Solution

300. The number of 3×3 non - singular matrices , with four entries as 1 and all other entries as 0 , is :

A. 6

B. at least 7

C. less than 4

D. 5

Answer: B

Watch Video Solution

301. If x, y, z being positive $\begin{vmatrix} 1 & \log_x y & \log_x z \\ \log_y x & 1 & \log_y z \\ \log_z x & \log_z y & 1 \end{vmatrix} =$

A. $\log x$

B. $\log y$

C. $\log_x z^2$

D. 0

Answer: D

Watch Video Solution

302. If $D_r = \begin{vmatrix} 2^r - 1 & 2.\ 3^{r-1} & 4.\ 5^{r-1} \\ \alpha & \beta & \gamma \\ 2^{n-1} & 3^{n-1} & 5^{n-1} \end{vmatrix}$ then $\sum_{r=1}^{n} D_r =$

A. 0

B. $\alpha\beta\gamma$

C. $\alpha + \beta + \gamma$

D. $\alpha.\ 2^n + \beta.\ 3^n + \gamma.\ 4^n$

Answer: A

Watch Video Solution

303. If a, b, c are in G.P then the value of the determinant $\Delta = \begin{bmatrix} a & b & ax+by \\ b & c & bx+cy \\ ax+by & bx+cy & 0 \end{bmatrix}$ is

A. 1

B. 0

C. -1

D. none of these

Answer: B

Watch Video Solution

304. The determinant:

$$\begin{vmatrix} xp+y & x & y \\ yp+z & y & z \\ 0 & xp+y & yp+z \end{vmatrix} = 0 \text{ if :}$$

A. x, y, z are in A.P

B. x, y, z are in G.P

C. x, y, z are in $H.P$

D. xy, yz, zx are in A.P

Answer: B

Watch Video Solution

305. The parameter on which the value of the determinant

$$\begin{vmatrix} 1 & a & a^2 \\ \cos(p-d)x & \cos px & \cos(p+d)x \\ \sin(p-d)x & \sin px & \sin(p+d)x \end{vmatrix}$$

does not depend upon is

A. a

B. p

C. d

D. x

Answer: B

Watch Video Solution

306. Let $\omega = -\frac{1}{2} + i\frac{\sqrt{3}}{2}$, then the value of

$$\begin{bmatrix} 1 & 1 & 1 \\ 1 & -1-\omega^2 & \omega^2 \\ 1 & \omega^2 & \omega^4 \end{bmatrix}$$ is

A. 3ω

B. $3\omega(\omega-1)$

C. $3\omega^2$

D. $3\omega(1-\omega)$

Answer: B

Watch Video Solution

307. l,m,n are the pth , qth rth terms of a G.P. (all positive) , then $\begin{vmatrix} \log l & p & 1 \\ \log m & q & 1 \\ \log n & r & 1 \end{vmatrix}$ equals :

A. 1

B. 0

C. -1

D. none of these

Answer: B

Watch Video Solution

308. If $a > 0$ and discriminant of $ax^2 + 2bx + c$ is negative, then :

$$\Delta = \begin{vmatrix} a & b & ax+b \\ b & c & bx+c \\ ax+b & bx+c & 0 \end{vmatrix} \text{ is :}$$

A. +ve

B. $(ac - b^2)(ax^2 + bx + c)$

C. $-ve$

D. 0

Answer: C

Watch Video Solution

309. If $1, \omega, \omega^2$ are the cube roots of unity, then

$$\begin{bmatrix} 1 & \omega^n & \omega^{2n} \\ \omega^n & \omega^{2n} & 1 \\ \omega^{2n} & 1 & \omega^n \end{bmatrix}$$

A. ω^2

B. 0

C. 1

D. ω

Answer: B

Watch Video Solution

310. The determinant : $\begin{vmatrix} \cos(\alpha+\beta) & -\sin(\alpha+\beta) & \cos 2\beta \\ \sin\alpha & \cos\alpha & \sin\beta \\ -\cos\alpha & \sin\alpha & \cos\beta \end{vmatrix}$ is

independent of :

A. α

B. β

C. α and β

D. neither α or β

Answer: A

Watch Video Solution

311. If $a_1, a_2, a_3 \ldots\ldots$ are in G.P. , then the value of

$$\Delta = \begin{vmatrix} \log a_n, \log a_{n+1}, \log a_{n+2} \\ \log a_{n+3}, \log a_{n+4}, \log a_{n+5} \\ \log a_{n+6}, \log a_{n+7}, \log a_{n+8} \end{vmatrix}$$ is :

A. 2

B. 1

C. 0

D. -2

Answer: C

Watch Video Solution

312. If $D = \begin{vmatrix} 1 & 1 & 1 \\ 1 & 1+x & 1 \\ 1 & 1 & 1+y \end{vmatrix}$ for $x \neq 0, y \neq 0$ then D is

A. divisible by both x and y

B. divisible by x but not y

C. divisible by y but not x

D. divisible by neither x nor y

Answer: A

Watch Video Solution

313. If $\alpha = \omega, b = \omega^2, c = i$, then the value of :

$$\begin{vmatrix} a & a+2b & a+2b+3c \\ 3a & 4a+6b & 5a+7b+9c \\ 6a & 9a+12b & 11a+15b+18c \end{vmatrix}$$ is :

A. $9a^2(a+b)$

B. $9b^2(a+b)$

C. $a^2(a+b)$

D. $b^2(a+b)$

Answer: B

Watch Video Solution

314. The value of $\Delta = \begin{vmatrix} 1^2 & 2^2 & 3^2 \\ 2^2 & 3^2 & 4^2 \\ 3^2 & 4^2 & 5^2 \end{vmatrix}$ is :

A. 8

B. -8

C. 400

D. 1

Answer: B

Watch Video Solution

315. If $a = 1 + 2 + 4 + \ldots.$ upto n terms

$b = 1 + 3 + 9 + \ldots.$ upto n terms

$c = 1 + 5 + 25 + \ldots.$ upto n terms

then $\Delta = \begin{vmatrix} a & 2b & 4c \\ 2 & 2 & 2 \\ 2^n & 3^n & 5^n \end{vmatrix} =$

A. $(30)^n$

B. $(10)^n$

C. 0

D. $2^n + 3^n + 5^n$

Answer: C

Watch Video Solution

316. If $\begin{vmatrix} x-2 & 2x-3 & 3x-4 \\ x-4 & 2x-9 & 3x-16 \\ x-8 & 2x-27 & 3x-64 \end{vmatrix} = 0$ then $x =$

A. -2

B. 3

C. -4

D. 4

Answer: D

Watch Video Solution

317. If a, b, c, d, e and f are in G.P, then the value of

$\left|\left[a^2, d^2, x\right], \left[b^2, e^2, y\right], \left[c^2, f^2, z\right]\right|$ depends on

A. x and y

B. x and z

C. y and z

D. x, y and z

Answer:

Watch Video Solution

318. The value of the determinant :

$$\Delta = \begin{vmatrix} a^2 & a & 1 \\ \cos nx & \cos(n+1)x & \cos(n+2)x \\ \sin nx & \sin(n+1)x & \sin(n+2)x \end{vmatrix}$$ is : in dependent is :

A. n

B. a

C. x

D. none of these

Answer: A

Watch Video Solution

319. If a, b, c are all different from zero and $\Delta = \begin{vmatrix} 1+a & 1 & 1 \\ 1 & 1+b & 1 \\ 1 & 1 & 1+c \end{vmatrix} = 0$, then $\frac{1}{a} + \frac{1}{b} + \frac{1}{c} =$

A. abc

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

C. $-a-b-c$

D. -1

Answer: D

Watch Video Solution

Watch Video Solution

320. $\begin{vmatrix} x & 1 & y+z \\ y & 1 & z+x \\ z & 1 & x+y \end{vmatrix} =$

A. $1+x+y+z$

B. $x+y+z$

C. 0

D. 1

Answer: C

Watch Video Solution

321. If $x \neq 0$ and $\begin{vmatrix} 1 & x & 2x \\ 1 & 3x & 5x \\ 1 & 3 & 4 \end{vmatrix} = 0$ then $x =$

A. 1

B. -1

C. 2

D. -2

Answer: B

Watch Video Solution

322. The real part of $\begin{bmatrix} \cos\alpha + i\sin\alpha & \cos\beta + i\sin\beta \\ \sin\beta + i\cos\beta & \sin\alpha + i\cos\alpha \end{bmatrix}$ is

A. $2\cos\alpha$

B. $2\sin\beta$

C. 0

D. 1

Answer: C

Watch Video Solution

323. If $a \neq 6, b, c$ satisfy $\begin{vmatrix} a & 2b & 2c \\ 3 & b & c \\ 4 & a & b \end{vmatrix} = 0$, then abc =

A. $a + b + c$

B. 0

C. b^3

D. $ab + bc$

Answer: C

Watch Video Solution

324. If d is the determinant of a square matrix A of order n, then the determinant of its adjoint is

A. d^N

B. d^{n-1}

C. d^{n-2}

D. d

Answer: B

Watch Video Solution

325. If $\begin{vmatrix} \cos(A+B) & -\sin(A+B) & \cos 2B \\ \sin A & \cos A & \sin B \\ -\cos A & \sin A & \cos B \end{vmatrix} = 0$ then $B =$

A. $(2n+1)\frac{\pi}{2}$

B. $n\pi$

C. $(2n+1)\pi$

D. $2n\pi$

Answer: A

Watch Video Solution

326. $\begin{vmatrix} 1990 & 1991 & 1992 \\ 1991 & 1992 & 1993 \\ 1992 & 1993 & 1994 \end{vmatrix} =$

A. 1992

B. 1993

C. 1994

D. 0

Answer: D

Watch Video Solution

327.

$\left|\log e, \log e^2, \log e^3\right], \left[\log e^2, \log e^3, \log e^4\right], \left[\log e^3, \log e^4, \log e^5\right] \mid =$

A. 0

B. 1

C. $4 \log e$

D. $5 \log e$

Answer: A

Watch Video Solution

328. If $A = \begin{bmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{bmatrix}$ and $B = \begin{bmatrix} c_1 & c_2 & c_2 \\ a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \end{bmatrix}$ then

A. $A = B$

B. $A = -B$

C. $B = A^2$

D. $B = 0$

Answer: A

Watch Video Solution

329. If $\begin{vmatrix} 1+\sin^2\theta & \cos^2\theta & 4\sin 2\theta \\ \sin^2\theta & 1+\cos^2\theta & 4\sin 2\theta \\ \sin^2\theta & \cos^2\theta & 4\sin 2\theta - 1 \end{vmatrix} = 0$ and $0 < \theta < \frac{\pi}{2}$

then $\cos 4\theta =$

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

B. $\frac{1}{2}$

C. $\sqrt{32}$

D. 0

Answer: B

Watch Video Solution

330. If $\left|\begin{vmatrix} x+1 & x+2 & x+a \\ x+2 & x+3 & x+b \\ x+3 & x+4 & x+c \end{vmatrix}\right| = 0$ then a,b,c are

A. equal

B. in A.P

C. in G.P

D. in $H.P$

Answer: B

Watch Video Solution

331. The constant term of the polynomial $\begin{vmatrix} x+3 & x & x+2 \\ x & x+1 & x-1 \\ x+2 & 2x & 3x+1 \end{vmatrix}$ is

A. 1

B. -1

C. 2

D. 0

Answer: B

Watch Video Solution

332. If ω is an imaginary cube root of unity ,then the value of $\begin{bmatrix}1 & \omega^2 & 1-\omega^4 \\ \omega & 1 & 1+\omega^5 \\ 1 & \omega & \omega^2\end{bmatrix}$ is

A. 4

B. w^2-4

C. w^2

D. 4

Answer: B

Watch Video Solution

333. $\begin{bmatrix} \sin\alpha & \cos\alpha & \sin(\alpha+\delta) \\ \sin\beta & \cos\beta & \sin(\beta+\delta) \\ \sin\gamma & \cos\gamma & \sin(\gamma+\delta) \end{bmatrix} =$

A. 0

B. 1

C. $1+\sin\alpha\sin\beta\sin\gamma$

D. $1-(\sin\alpha-\sin\beta)(\sin\beta-\sin\gamma)(\sin\gamma-\sin\alpha)$

Answer: A

Watch Video Solution

334. If $A = \begin{vmatrix} x & 1 & 1 \\ 1 & x & 1 \\ 1 & 1 & x \end{vmatrix}$ and $B = \begin{vmatrix} x & 1 \\ 1 & x \end{vmatrix}$, then $\frac{dA}{dx} =$

A. $3B + 1$

B. $3B$

C. $-3B$

D. $1 - 3B$

Answer: B

Watch Video Solution

335. If α, β and $\gamma$are roots of the equations $x^3 + px + q = 0$ then the value of det : $\begin{bmatrix} \alpha & \beta & \gamma \\ \beta & \gamma & \alpha \\ \gamma & \alpha & \beta \end{bmatrix}$ is

A. q

B. b

C. p

D. $p^2 - 2q$

Answer: B

Watch Video Solution

336. If $\Delta_r = \begin{vmatrix} 2r-1 & mC_r & 1 \\ m^2-1 & 2^m & m+1 \\ m^2+m+1 & 2^m+1 & m+2 \end{vmatrix}$, then $\sum_{r=0}^{m} \Delta_r =$

A. 3

B. 0

C. 12

D. 15

Answer: A

Watch Video Solution

337. If $a+b+c=0$, one root of :

$$\begin{vmatrix} a-x & c & d \\ c & b-x & a \\ b & a & c-x \end{vmatrix} = 0 \text{ is :}$$

A. $x=1$

B. $x=2$

C. $x=a^2+b^2+c^2$

D. $x=0$

Answer: D

Watch Video Solution

338. If $a \ne b \ne c$ one value of x which satisfies thte equation :

$$\begin{vmatrix} 0 & x-a & x-b \\ x+a & 0 & x-c \\ x+b & x+c & 0 \end{vmatrix} = 0$$ is given by :

A. a

B. b

C. c

D. 0

Answer: D

Watch Video Solution

339. If $\begin{vmatrix} b+c & c+a & a+b \\ a+b & b+c & c+a \\ c+a & a+b & b+c \end{vmatrix} = k \begin{vmatrix} a & b & c \\ c & a & b \\ b & c & a \end{vmatrix}$ then the value of k is

A. 1

B. 2

C. 3

D. 4

Answer: B

Watch Video Solution

340. The determinant :

$$\begin{vmatrix} a & b & a\alpha + b \\ b & c & b\alpha + c \\ a\alpha + b & b\alpha + c & 0 \end{vmatrix} = 0 \text{ if :}$$

A. a, b, c are in $A.P$

B. a, b, c are in G.P

C. a, b, c are in $H.P$

D. α is a root of $ax^2 + bx + c = 0$

Answer: B

Watch Video Solution

341. If $D_r = \begin{vmatrix} r & 1 & \frac{n(n+1)}{2} \\ 2r-1 & 4 & n^2 \\ 2^{r-1} & 5 & 2^n - 1 \end{vmatrix}$ $then$, sum_(r=1)^n D_r`

A. 0

B. 1

C. $\dfrac{n(n+1)(2n+1)}{6}$

D. none of these

Answer: A

Watch Video Solution

342. If ω is a complex cube root of unity then a root of the equation

$$\begin{vmatrix} x+1 & \omega & \omega^2 \\ \omega & x+\omega^2 & 1 \\ \omega^2 & 1 & x+\omega \end{vmatrix} = 0 \text{ is}$$

A. $x = 1$

B. $x = \omega$

C. $x = \omega^2$

D. $x = 0$

Answer: D

Watch Video Solution

343. If $C = 2\cos\theta$, then the value of the determinant

$$\Delta = \begin{vmatrix} C & 1 & 0 \\ 1 & C & 1 \\ 6 & 1 & C \end{vmatrix} \text{ is}$$

A. $\dfrac{\sin 4\theta}{\sin\theta}$

B. $\frac{2\sin^2 2\theta}{\sin\theta}$

C. $4\cos^2\theta(2\cos\theta - 1)$

D. none of these

Answer: D

Watch Video Solution

344. If the determinant

$$\begin{vmatrix} a & b & 2a\alpha + 3b \\ b & c & 2b\alpha + 3c \\ 2a\alpha + 3b & 2b\alpha + 3c & 0 \end{vmatrix} = 0 \text{ then}$$

A. 1)a, b, c are in H.P

B. 2)α is a root of $4ax^2 + 12bx + 9c = 0$ or a, b, c are in G.P.

C. 3)a, b, c are in G, P only

D. 4)a, b, c are in A.P

Answer: B

Watch Video Solution

345. If a, b, c are different, then value of x satisfying the equation

$$\begin{vmatrix} 0 & x^2 - a & x^3 - b \\ x^2 + a & 0 & x^2 + c \\ x^4 + b & x - c & 0 \end{vmatrix} = 0 \text{ is}$$

A. c

B. a

C. b

D. 0

Answer: D

Watch Video Solution

346. If x is a positive integer, then

$$\begin{vmatrix} x! & (x+1)! & (x+2)! \\ (x+1)! & (x+2)! & (x+3)! \\ (x+2)! & (x+3)! & (x+4)! \end{vmatrix} =$$

A. $2x!(x+1)t$

B. $2x!(x+1)!(x+2)!$

C. $2x!(x+3)!$

D. $2(x+1)!(x+2)!(x+3)!$

Answer: B

Watch Video Solution

347. Let

$$\begin{vmatrix} x^2+3x & x-1 & x+3 \\ x+1 & -2x & x-4 \\ x-3 & x+4 & 3x \end{vmatrix} = ax^4+bx^3+cx^2+dx+e$$ be an

identity in x, where a, b, c, d are independent of x. Then the value of e is

A. 4

B. 0

C. 1

D. none of these

Answer: B

Watch Video Solution

348. If α, β and $\gamma$are roots of the equations $x^3 + px + q = 0$ then the value of det : $\begin{bmatrix} \alpha & \beta & \gamma \\ \beta & \gamma & \alpha \\ \gamma & \alpha & \beta \end{bmatrix}$ is

A. p

B. q

C. $p^2 - 2q$

D. none of these

Answer: D

Watch Video Solution

349. If a, b, c are in G.P then the value of the determinant

$$\Delta = \begin{bmatrix} a & b & ax+by \\ b & c & bx+cy \\ ax+by & bx+cy & 0 \end{bmatrix}$$ is

A. zero

B. positive

C. negative

D. $b^2 + ac$

Answer: C

Watch Video Solution

Watch Video Solution

350. If $\Delta = \begin{vmatrix} 0 & b-a & c-a \\ a-b & 0 & c-b \\ a-c & b-c & 0 \end{vmatrix}$ then $\Delta =$

A. $a+b+c$

B. $-(a+b+c)$

C. abc

D. 0

Answer: D

Watch Video Solution

351. If $\Delta_r = \begin{vmatrix} 2r-1 & mC_r & 1 \\ m^2-1 & 2^m & m+1 \\ m^2+m+1 & 2^m+1 & m+2 \end{vmatrix}$, then $\sum_{r=0}^{m} \Delta_r =$

A. 0

B. $m^2 - 1$

C. 2^n

D. $2^m \sin^2(2^m)$

Answer: A

Watch Video Solution

352. The value of the determinant

$$\begin{vmatrix} 10! & 11! & 12! \\ 11! & 12! & 13! \\ 12! & 13! & 14! \end{vmatrix} =$$

A. $2(10!.\ 11!)$

B. $2(10!.\ 13!)$

C. $2(10!.\ 11!.\ 12!)$

D. $2(11!.\ 12!.\ 13!)$

Answer: C

Watch Video Solution

353. If ω is an imaginary cube root of unity, then the value of

$$\begin{vmatrix} a & b\omega^2 & a\omega \\ b\omega & c & b\omega^2 \\ c\omega^2 & a\omega & c \end{vmatrix}$$

A. $a^3 + b^3 + c$

B. $a^2b - b^2c$

C. 0

D. $a^3 + b^3 + c^3 - 3abc$

Answer: C

Watch Video Solution

354. Let a, b, c be such that $b(a+c) \neq 0$. If

$$\begin{vmatrix} a & a+1 & a-1 \\ -b & b+1 & b-1 \\ c & c-1 & c+1 \end{vmatrix} + \begin{vmatrix} a+1 & b+1 & c-1 \\ a-1 & b-1 & c+1 \\ (-1)^{n+2}a & (-1)^{n+1}b & (-1)^{n}c \end{vmatrix} = 0$$

then the value of n is

A. any integer

B. zero

C. any even integer

D. any odd integer

Answer: D

Watch Video Solution

355. If $f(x) = \begin{vmatrix} 1 & x & x+1 \\ 2x & x(x-1) & (x+1)x \\ 3x(x-1) & x(x-1)(x-2) & (x+1)x(x-1) \end{vmatrix}$

then f (100) is equal to :

A. 0

B. 1

C. 100

D. -100

Answer: A

Watch Video Solution

356. Let a, b, c be positive real numbers. The following system of equations in x, y and z

$$\frac{x^2}{a^2}+\frac{y^2}{b^2}-\frac{z^2}{c^2}=1, \frac{x^2}{a^2}-\frac{y^2}{b^2}+\frac{z^2}{c^2}=1, \frac{-x^2}{a^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2}=1$$

has

A. no solution

B. unique solution.

C. infinitely many solutions

D. finitely many solution

Answer: B

Watch Video Solution

357. Given, $2x - y + 2z = 2$

$x - 2y + z = -4$

$x + y + \lambda z = 4$

then the value of λ such that the given system of equations has no solution is

A. 3

B. 1

C. 0

D. -3

Answer: B

Watch Video Solution

358. If the system of equations $x + ay = 0, az + y = 0$ and $ax + z = 0$ has infinite solutions, then the value of a is

A. -1

B. 1

C. 0

D. no real values

Answer: A

Watch Video Solution

359. The number of values of k for which the system of equations :

$(k+1)x + 8y = 4k$

$kx + (k+3)y = 3k - 1$

has no solution is:

A. 0

B. 1

C. 2

D. infinite

Answer: B

Watch Video Solution

360. If the system of the equations :

$x - ky - z = 0, kx - y - z = 0, x + y - z = 0$ has a non - zero solution, then the possible values of k are :

A. $-1, 2$

B. 1,2

C. 0,1

D. $-1, 1$

Answer: D

Watch Video Solution

361. The number of values of k for which the linear equations :

$4x + ky + 2z = 0$

$kx + 4y + z = 0$

$2x + 2y + z = 0$

possess a non - zero solution is :

A. 0

B. 3

C. 2

D. 1

Answer: C

Watch Video Solution

362. Consider the system of linear equations :

$x_1 + 2x_2 + x_3 = 3$

$2x_1 + 3x_2 + x_3 = 3$

$3x_1 + 5x_2 + 2x_3 = 1$

The system has :

A. a unique solution

B. no solution

C. infinite number of solutions

D. exactly three solutions

Answer: B

Watch Video Solution

363. The system of equations

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

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

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

has no solution if α is(a)

A. 1

B. not -2

C. either -2 or 1

D. -2

Answer: D

Watch Video Solution

364. If the system of equations : $x+4ay+az=0, x+3by+bz=0, x+2cy+cz=0$ has a non a non - zero solution ,then a,b,c are in :

A. satisfy $a+2b+3c=0$

B. are in A.P

C. are in G.P

D. are in H.P

Answer: D

Watch Video Solution

365. The value of a for which the system of equations

$a^3x+(a+1)^3y+(a+2)^3z=0$

$ax+(a+1)y+(a+2)z=0$

$x + y + z = 0$

`has a non-zero solution is

A. 0

B. -1

C. 1

D. none of these

Answer: B

Watch Video Solution

366. The system of equations :

$x + y + z = 6$

$x + 2y + 3z = 10$

$x + 2y + \lambda z = \mu$

has no solution for

A. $\lambda \neq 3, \mu = 10$

B. $\lambda = 3, \mu \neq 10$

C. $\lambda \neq 3, \mu \neq 10$

D. none of these

Answer: B

Watch Video Solution

367. Consider the system of equations in x, y, z as

$x \sin 3\theta - y + z = 0$

$x \cos 2\theta + 4y + 3z = 0$

$2x + 7y + 7z = 0$

$Ifthissystemhasanon - trivialsolution, thenf$ or $any \int e \geq r$n,

$valuesof$theta$aregiven$

A. $\left[\left[n + \frac{(-1)^n}{3}\right]\pi\right.$

B. $\left[\left[n+\frac{(-1)^n}{4}\right]\pi\right.$

C. $\left[\left[n+\frac{(-1)^n}{6}\right]\pi\right.$

D. $\frac{n\pi}{2}$

Answer: C

Watch Video Solution