DETERMINANTS

MULTIPLE CHOICE QUESTIONS

1.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

2. If the points (3, -2), (x, 2), (8, 8) are collinear, then find the value of x.
(a) 2
(b) 3
(c) 4
(d) 5

3. Using determinants, find the equation of the line joining the points (1, 2) and (3, 6).
(a) y = 2x
(b) x = 3y
(c) y = x
(d) 4x – y = 5

4. If A and B are matrices of order 3 and $|A| = 5, |B| = 3$ then value of $|3AB|$ is

(a) 605 (b) 205 (c) 405 (d) 305

5. A square matrix A has inverse if and only if

a)A is singular matrix b) A is non-singular matrix

c) A is a zero- matrix d) Both a and c

6. IfA=$\begin{pmatrix} x & 4 \\ 3 & x \end{pmatrix}$ $and|A^3|$=64,$henthevalueofxis$

(a)±2 (b)±4 (c) ±8 d ±1

7.Iffor matrixA, |A|= 3, wherematrix A isof order2×2,then|5A|is

a)9 b)75 c)15 d)2

8. IfAis a squarematrixsuchthat A^2=I, then $A^{-1}$is equal to

a) 2A

b) O

c) A

d) A+I

9. Giventhat A isasquarematrix of order 3 and|A|=-4,then|adj A|is equalto

a)4

b)-4

c)16

d)-16

10. Whichofthe followingisa correctstatement?

a) Determinantisasquarematrix

b) Determinantisanumberassociatedtoamatrix

c) Determinantisa numberassociated withtheorderofthematrix

d)Determinantisanumberassociatedtoasquarematrix

11. The minor M_{ij} of an element a_{ij} of a determinant is defined as the value of the determinant obtained after deleting the

(a) jth row of the determinant

(b) ith column and jth row of the determinant

(c) ith row and jth column of the determinant

(d) ith row of the determinant

12. If A and B are any 2 × 2 matrices , then det. (A+B) = 0 implies

(a) det A = 0 and det B = 0

(b) det A = 0 or det B = 0

(c) detA + det B = 0

(d) None of these

13. If A is a square matrix of order 3 and |A| = 7 then $|A^T|$ =

(a) 7

(b) 21

(c) 1/7

(d) 3

14.In a third order determinant, each element of the first column consists of sum of two terms, each element of the second column consists of sum of three terms and each element of the third column consists of sum of four terms. Then it can be decomposed into n determinants, where n has value

(a) 1

(b) 9

(c) 24

(d) 16

15.The values of x for which $\begin{vmatrix} 3 & x \\ x & 1 \end{vmatrix} = \begin{vmatrix} 3 & 2 \\ 4 & 1 \end{vmatrix}$

a. 2 b. $\sqrt{2}$ c. $-\sqrt{2}$ d. $\pm 2\sqrt{2}$

16. Let A be a square matrix of order 3 then |kA| is equal to

a) K |A| b) k^2|A| c) k^3|A| d) 3K|A|

17. If the points (3, -2), (x, 2), (8, 8) are collinear, then find the value of x.
(a) 2
(b) 3
(c) 4
(d) 5

18. The minor of the element a_{23} in $\begin{bmatrix} 5 & 3 & 8 \\ 2 & 0 & 1 \\ 1 & 2 & 3 \end{bmatrix}$

(a) 7
(b) -7
(c) 4
(d) 8

19. If A = $\begin{bmatrix} 2 & \lambda & -3 \\ 0 & 2 & 5 \\ 1 & 1 & 3 \end{bmatrix}$ then A^{-1} exists if
(a) $\lambda = 2$
(b) $\lambda \neq 2$

(c) $\lambda \neq -2$

(d) None of these

20. If A and B are invertible matrices, then which of the following is not correct?

(a) adj A = $|A|.A^{-1}$

(b) det $(A)^{-1}$ = $[\det(A)]^{-1}$

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

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

21. If $\begin{vmatrix} b+c & c+a & a+b \\ c+a & a+b & b+c \\ a+b & b+c & c+a \end{vmatrix} = k\begin{vmatrix} a & b & c \\ b & c & a \\ c & a & b \end{vmatrix}$ then k =

(a) 0

(b) 1

(c) 2

(d) 3

22. A system of linear equations AX = B is said to be inconsistent, if the system of equations has

(a) Trivial Solution

(b) Infinite Solutions

(c) No Solution

(d) Unique Solutions

23. System of equations AX = B is inconsistent if

(a) $|B| = 0$

(b) (adj A) B = 0, $|A| = 0$

(c) (adj A) B ≠ 0, $|A| = 0$

(d) $|A| \neq 0$

24. If A is a square matrix of order 3 and $|A| = 5$ then $|3A|$ =?

(a) 135 (b) 45 (c) 15 (d) 32

25. Inverse of a matrix A exists, if

(a) $|A| = 0$ (b) A is non-singular (c) A is singular (d) $A^T = A$

26. If matrix A = $\begin{bmatrix} 2 & 6 \\ 1 & 4 \end{bmatrix}$ and $A^2 + aA + bI = O$, then the values of a and b are:

(a) a = – 6, b = 2 (b) a = 6, b = – 2 (c) a = 6, b = 2 (d) a = – 6, b = – 2

27. If A is a square matrix of order 3 and $|A| = 7$ then $|2A^T|$ =

(a) 56 (b) 14 (c) 8/7 (d) 28

28. Points (a, a, c), (1,0,1) and (c, c, b) are collinear if

(a) a,b,c in GP (b) a,b,c in AP (c) c^2 = ab (d) c = ab

29. If A is a skew - symmetric matrix of odd order n, then

(a) |A|=0 (b) |A|= -1 (c) |A|= $|A^T|$ =1 (d) None of these

30. The determinant $\begin{vmatrix} x & \sin\theta & \cos\theta \\ -\sin\theta & -x & 1 \\ \cos\theta & 1 & x \end{vmatrix}$

(a) Independent of θ only

(b) Independent of x only

(c) Independent of both θ and x

(d) None of these

31. If A is non-singular square matrix of order 3 and |A|=3, then |adjA| is equal to

(a) 3 (b) 9 (c) 24 (d) 16

32. If A is non-singular square matrix of order 3 and |A|=3, then |adj(adjA)| is equal to

(a) 3 (b) 9 (c) 27 (d) 81

33. If $\begin{vmatrix} 2 & 3 \\ 4 & 5 \end{vmatrix}$=$\begin{vmatrix} x & 3 \\ 2x & 7 \end{vmatrix}$, then the value of x is

(a) 1

(b) 2

(c) -2

(d) 4

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

(a) 12 (b) 14 (c) -14 (d) 11

35. The value of x if $\begin{vmatrix} x & 2 \\ 18 & x \end{vmatrix} = \begin{vmatrix} 6 & 2 \\ 18 & 6 \end{vmatrix}$

(a) 6
(b) ±6
(c) -1
(d) -6

36. If any two rows or columns of a determinant are equal or identical, then the value of the determinant is

(a)-1

(b) 1

(c) 0

(d)none of these

37. If A is a square matrix of order 3 and |A| = 5 then |-A| = ?

(a) 5

(b) -5

(c) 15

(d) 1

38. Find the area of the triangle with vertices P(4, 5), Q(4, -2) and R(-6, 2).
(a) 21 sq. units
(b) 35 sq. units
(c) 30 sq. units
(d) 40 sq. units

39. If A is a square matrix of order 3, such that A(adjA) = 10I, then |adj A| is equal to

(a) 1 (b) 10 (c) 100 d) 1000

40. If the points (a_1, b_1), (a_2, b_2) and $(a_1 + a_2, b_1 + b_2)$ are collinear, then
(a) $a_1b_2 = a_2b_1$
(b) $a_1 + a_2 = b_1 + b_2$
(c) $a_2b_2 = a_1b_1$
(d) $a_1 + b_1 = a_2 + b_2$

41. If the points (2, -3), (k, -1) and (0, 4) are collinear, then find the value of 4k.
(a) 4
(b) 7/140
(c) 47
(d) 40/7

42. Find the area of the triangle whose vertices are (-2, 6), (3, -6) and (1, 5).
(a) 30 sq. units
(b) 35 sq. units
(c) 40 sq. units
(d) 15.5 sq. units

43. The value of $\begin{vmatrix} \cos 15° & \sin 15° \\ \sin 15° & \cos 15° \end{vmatrix}$ is:

a) 1
b) $\frac{1}{2}$
c) $\frac{\sqrt{3}}{2}$
d) 0

44. If $x, y \in R$, then determinant $\Delta = \begin{vmatrix} cosx & -sinx & 1 \\ sinx & cosx & 1 \\ \cos(x+y) & -\sin(x+y) & 0 \end{vmatrix}$ lies in the interval

(a) $[-\sqrt{2}, \sqrt{2}]$(b) $[-1,1]$ (c)$[-\sqrt{2}, 1]$ (d) $[-1, -\sqrt{2}]$

45. There are two values of a which makes the determinant $\Delta = \begin{vmatrix} 1 & -2 & 5 \\ 2 & a & -1 \\ 0 & 4 & 2a \end{vmatrix}$ equal to 86.

The sum of these two values is

(a) 4 (b) 5 (c) -4 (d) 9

46. If A is an invertible matrix, then which of the following is not true

(a) $(A^2)^{-1} = (A^{-1})^2$ (b) $|A^{-1}| = |A|^{-1}$

(c) $(A^T)^{-1} = (A^{-1})^T$ (d) $|A| \neq 0$

47. Let $A = \begin{bmatrix} 1 & 2 \\ 3 & -5 \end{bmatrix}$ $and\ B = \begin{bmatrix} 1 & 0 \\ 0 & 2 \end{bmatrix}$ $and\ X$ be a matrix such that $A = BX$, then X is equal to

(a) $\frac{1}{2}\begin{bmatrix} 2 & 4 \\ 3 & -5 \end{bmatrix}$ (b)$\frac{1}{2}\begin{bmatrix} -2 & 4 \\ 3 & 5 \end{bmatrix}$

(c) $\begin{bmatrix} 2 & 4 \\ 3 & -5 \end{bmatrix}$ (d) $\begin{bmatrix} 2 & 4 \\ -3 & 5 \end{bmatrix}$

48. If for the matrix A, $A^3 = I$, then $A^{-1} =$

(a) A^2(b) A^3 (c)A (d) I

49. The number of real roots of the equation $\begin{vmatrix} x & -6 & -1 \\ 2 & -3x & x-3 \\ -3 & 2x & x+2 \end{vmatrix} = 0$is :

(a) 0 (b) 1 (c) 2 (d) 3

50.If $= \begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix}$, and $A_{ij} = cofactor\ of\ a_{ij} in\ |A|$,then $adjA$ is

(a) $\begin{bmatrix} A_{11} & A_{12} & A_{13} \\ A_{21} & A_{22} & A_{23} \\ A_{31} & A_{32} & A_{33} \end{bmatrix}$ (b)$\begin{bmatrix} A_{11} & A_{21} & A_{31} \\ A_{12} & A_{22} & A_{32} \\ A_{13} & A_{23} & A_{33} \end{bmatrix}$

(c) $\begin{bmatrix} -A_{11} & A_{12} & -A_{13} \\ A_{21} & -A_{22} & A_{23} \\ -A_{31} & A_{32} & -A_{33} \end{bmatrix}$ (d) $\begin{bmatrix} A_{11} & -A_{21} & A_{31} \\ -A_{12} & A_{22} & -A_{32} \\ A_{13} & -A_{23} & A_{33} \end{bmatrix}$

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

(a) $\lambda = 2$(b) $\lambda = -2$ (c) $\lambda \neq -2$ (d)) $\lambda \neq -\frac{8}{5}$

52. The value of $\begin{vmatrix} 1 & \omega & \omega^2 \\ \omega & \omega^2 & 1 \\ \omega^2 & \omega & 1 \end{vmatrix}$ is equal to ($\omega \neq 1$, being a cube root of unity)

(a) 0 (b) 1 (c) 3 (d) -1

53. The value of $\begin{vmatrix} 5^2 & 5^3 & 5^4 \\ 5^3 & 5^4 & 5^5 \\ 5^4 & 5^5 & 5^6 \end{vmatrix}$ is

(a) 5^2 (b) 0 (c) 5^{13} (d) 5^9

54. If A is any of square matrix of order n, then $A(adj\ A)$ is equal to

(a) I (b) $|A|I_n$ (c) 0 (d) $|A|^n$

55. Let f(z) = $\begin{vmatrix} 5 & 3 & 8 \\ 2 & z & 1 \\ 1 & 2 & z \end{vmatrix}$ then f(5) is equal to

a. 10 b. -20 c.80 d. none of these

56. Let f(z) = $\begin{vmatrix} x & -4 & 5 \\ 1 & 1 & -2 \\ 2 & x & 1 \end{vmatrix}$ then f'(5) is equal to

a. 1 b. -20 c. 40 d. none of these

57. If f(x) = $\begin{vmatrix} 0 & x-1 & x-2 \\ x+1 & 0 & x-c \\ x+2 & x+c & 0 \end{vmatrix}$ then

a. f (10) = 0 b. f (2) = 0 c. f (3) = 0 d. f (0) = 0

58. If A is a singular matrix, then A(adjA) is

a. null matrix b. scalar matrix c. identity matrix d. none of these

59. If A is a square matrix such that (A-2I)(A+I) = 0, Then A^{-1} is

a. (A-I)/2 b. (A+I)/2 c. 2(A-I) d.2(A+I).

60. If A is a square matrix of order 3x3, then $(A^2)^{-1}$ is

a. $(A^{-1})^3$ b. $(A^{-1})^9$ C. $(A^{-1})^2$ d. none of these

61. If A is a non- singular matrix of order 3x3 and |adjA| = $|A|^K$, then write the value of k.

a. -2 b. 2 c. 4 d. 1

62. If A = $\begin{bmatrix} 3 & 1 \\ 2 & 5 \end{bmatrix}$ Then find A^{-1}.

a. 1/13 $\begin{bmatrix} 5 & -1 \\ -2 & 3 \end{bmatrix}$ b. $\begin{bmatrix} 5 & -1 \\ -2 & 3 \end{bmatrix}$ c. 1/2$\begin{bmatrix} 5 & -1 \\ -2 & 3 \end{bmatrix}$ d. 1/13$\begin{bmatrix} 5 & 2 \\ -1 & 3 \end{bmatrix}$

63. If |A| = 2, where A is 2x2 matrix, then |adjA|=

a)2 b)16 c)4 d)8

64. The transformation due to reflection of (x,y) through the origin is described by the matrix.

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

65. For the matrix equation AB = AC, we say B =C Provided A Is

a. singular matrix b. square matrix c. skew symmetric matrix d. non-singular matrix

66. For any 2x2 matrix A, if A.(adjA) = $\begin{pmatrix} 12 & 0 \\ 0 & 12 \end{pmatrix}$, then $|A|^3$ equals.

a. 12^2 b. 12^3 c. 12^4 d. none of these

67. If A and B are square matrices of same order then $(AB)^{-1}$Is

a. $B^{-1}A^{-1}$ B. $A^{-1}B^{-1}$ C. B^{-1} A d)$A^{-1}B$

68. If A is a square matrix of order 2 such that A(adj A)=$\begin{bmatrix} -2 & 0 \\ 0 & -2 \end{bmatrix}$ then $|A|$

(A). 2

(B). 3

(C) -2

(D) -3

69. Which of the following is not true

(A). If A=$[a_{ij}]$ is a diagonal matrix of order n≥2,then$|A|$=$a_{11}.a_{22}\dots..a_{nn}$

(B).If A and B are square matrix of same order, then $|AB| = |A||B|$

(C).If A is a square matrix of order n then $|kA| = k^n|A|$

(D). If A and B are square matrix of same order, then $|A+B| = |A| + |B|$

70. If A is a non- singular matrix of order 3 such that $A^2 = 3A$,then value of $|A|$ is

(A)-3

(B)3

(C)9

(D)27

71. If $\begin{vmatrix} 2 & 3 & 2 \\ x & x & x \\ 4 & 9 & 1 \end{vmatrix} + 3 = 0$,then the value of x is

(A)3

(B)0

(C)-1

(D)1

72. For any two square matrix A and B, $|A| = 2$ &$|B| = 6$ then $|AB|$ is

(A)2

(B)6

(C)12

(D)8

73. The value of $\begin{vmatrix} 6 & 0 & -1 \\ 2 & 1 & 4 \\ 1 & 1 & 3 \end{vmatrix}$ is

(A)-7

(B)7

(C)8

(D)10

74. The number of distinct real roots of $\begin{vmatrix} sinx & cosx & cosx \\ cosx & sinx & cosx \\ cosx & cosx & sinx \end{vmatrix}$=0 in the interval $\frac{-\pi}{4} \leq x \leq \frac{\pi}{4}$ is

(A)0

(B)2

(C)1

(D)3

75. Let f(t) = $\begin{vmatrix} cost & t & 1 \\ 2sint & t & 2t \\ sint & t & t \end{vmatrix}$,then $\lim_{t \to 0} \frac{f(t)}{t^2}$

(A)0

(B)-1

(C)2

(D)3

76. If A =diag (1,2,3), then $|A|$=

(A)1

(B)2

(C)3

(D)6

77. If A is a skew symmetric matrix of order 3x3, then $|A|$=

(A)-1

(B)0

(C)1

(D)3

78. If A =diag (1,2,3), then $|A^2|$=

(A)4

(B)25

(C)9

(D)36

79. If A is an invertible matrix of then $|A^{-1}|$ =

(A)$|A|$

(B)$\frac{1}{|A|}$

(C)1

(D)0

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

(A)non-singular

(B)singular

(C)symmetric

(D)skew-symmetric

81. The value of determinant $\begin{vmatrix} x & x+1 \\ x-1 & x \end{vmatrix}$ is equal to:

a)1 b) 0 c) x d) x^2

82.A square matrix A is invertible, if and only if :

a) A is singular matrix i.e. $|A| = 0$
b) A is non - singular matrix i.e. $|A| \neq 0$
c) A is symmetric matrix
d) A is skew symmetric matrix

83. The area of triangle whose vertices are (3, 8), (-4, 2) and (5, 1) is:

a) 61 sq units
b) 62 sq units
c) $\frac{61}{2}$ sq units

d) 60 sq units

84.If $\Delta = \begin{vmatrix} a & h & g \\ h & b & f \\ g & f & c \end{vmatrix}$, then the cofactor A_{21} is:

a) – (hc + fg)
b) fg – hc
c) fg + hc
d) hc - fg

85.The value of x for which the matrix A = $\begin{bmatrix} 6 & x \\ 12 & 4 \end{bmatrix}$ is singular:

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

86. The minor and cofactors of all the elements (in the order $a_{11}, a_{12}, a_{21}, a_{22}$) of the determinant $\begin{vmatrix} 2 & -1 \\ 3 & 5 \end{vmatrix}$ are respectively.

a) 5, -3, -1, 2 and 5, -3, -1, 2
b) 5, -3, 1, 2 and 5, 3, -1, 2
c) 5, 3, -1, 2 and 5, -3, 1, 2
d) 5, -1, 3, 2 and 5, -3, 1, 2

87. If the points A (3, -2), B (K, 2) and C (8, 8) are collinear, then the value of k is:

a) 2
b) -3
c) 5
d) -4

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

a) 2A
b) A
c) O
d) A + I

89. If A, B and C are the angles of the triangles $\Delta\, ABC$, then the determinant

$$\begin{vmatrix} -1 & \cos C & \cos B \\ \cos C & -1 & cosA \\ \cos B & \cos A & -1 \end{vmatrix}$$

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

90. If A is a 3 x 3 matrix such that |A| = 8 then |3A| equals

(A) 8

(B) 24

(C) 72

(D) 216

91. If A = $\begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix}$ and A_{ij} is cofactor of a_{ij}, then value of determinant is given by

(A)$a_{11}A_{31} + a_{12}A_{32} + a_{13}A_{33}$

(B)$a_{11}A_{11} + a_{12}A_{21} + a_{13}A_{31}$

(C) $a_{21}A_{11} + a_{22}A_{12} + a_{23}A_{13}$

(D) $a_{11}A_{11} + a_{21}A_{21} + a_{31}A_{31}$

92. If area of triangle is 35 units with vertices (2,-6), (5,4) and (k, 4). then value of k is

(A) 12

(B) 2

(C) -12, -2

(D) 12, -2

93. If A = $\begin{bmatrix} 2 & p & -3 \\ 0 & 2 & 5 \\ 1 & 1 & 3 \end{bmatrix}$ then A^{-1} exists if

(A) p = 2

(B) p = -2

(C) None of these

(D) $p \neq 2$

94. If A is an invertible matrix, then det(A^{-1}) is equals to

(A) det (A)

(B) $[\det(A)]^{-1}$

(C) 1

(D) 0

95. If A = $\begin{bmatrix} b & 0 & 0 \\ 0 & b & 0 \\ 0 & 0 & b \end{bmatrix}$, then det(adjA) equals to

(A) b^{27}

(B) b^9

(C) b^6

(D) b^2

· 96 Find the adjoint of the matrix A = $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$

(A) $\begin{bmatrix} 4 & 2 \\ 3 & 1 \end{bmatrix}$

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

(C) $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$

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

97. 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 the above

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

(A) $\frac{1}{17}\begin{bmatrix} 2 & 3 \\ -3 & 4 \end{bmatrix}$

(B) $\frac{1}{17}\begin{bmatrix} 4 & 3 \\ -3 & 2 \end{bmatrix}$

(C) $\frac{-1}{17}\begin{bmatrix} 4 & 3 \\ -3 & 2 \end{bmatrix}$

(D) $\frac{1}{17}\begin{bmatrix} 4 & 3 \\ -3 & -2 \end{bmatrix}$

99. If A = $\begin{bmatrix} 2 & 3 \\ 1 & -4 \end{bmatrix}$ and B = $\begin{bmatrix} 1 & -2 \\ -1 & 3 \end{bmatrix}$, then find $(AB)^{-1}$

(A) $\frac{1}{11}\begin{bmatrix} 14 & 5 \\ 5 & 1 \end{bmatrix}$

(B) $\frac{1}{11}\begin{bmatrix} 14 & -5 \\ -5 & 1 \end{bmatrix}$

(C) $\frac{1}{11}\begin{bmatrix} 1 & 5 \\ 5 & 14 \end{bmatrix}$

(D) $\frac{1}{11}\begin{bmatrix} 1 & -5 \\ -5 & 14 \end{bmatrix}$

100. If A and B are two matrices such as AB=BA = I, then choose the incorrect option:

(A) A^{-1}=B

(B) B^{-1}= A

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

(D) $(A^{-1})^{-1}$ = A

101. For a square matrix A in matrix equation AX = B, then the most suitable answer

(A) |A| $\neq 0$, there exists unique solution.

(B) |A| = 0 and (adjA)B$\neq 0$, then there exists no solution.

(C) |A| = 0 and (adjA)B$= 0$, then system may or may not be consistent.

(D) All of the above

102. Find x, if $\begin{bmatrix} 1 & 2 & x \\ 1 & 1 & 1 \\ 2 & 1 & -1 \end{bmatrix}$ is singular

(A) 1

(B) 2

(C) 3

(D) 4

103. If $\Delta = \begin{vmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{vmatrix}$ and A_1, B_1, C_1 denote the co-factors of a_1, b_1, c_1 respectively, then the value of the determinant $\begin{vmatrix} A_1 & B_1 & C_1 \\ A_2 & B_2 & C_2 \\ A_3 & B_3 & C_3 \end{vmatrix}$ is

(a) Δ (b) Δ^2

(c) Δ^3 (d) 0

104. If in the determinant $\Delta = \begin{vmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{vmatrix}$, A_1, B_1, C_1 etc. be the co-factors of a_1, b_1, c_1 etc., then which of the following relations is incorrect

(a) $a_1 A_1 + b_1 B_1 + c_1 C_1 = \Delta$

(b) $a_2 A_2 + b_2 B_2 + c_2 C_2 = \Delta$

(c) $a_3 A_3 + b_3 B_3 + c_3 C_3 = \Delta$

(d) $a_1 A_2 + b_1 B_2 + c_1 C_2 = \Delta$

105. If ω is a cube root of unity and $\Delta = \begin{vmatrix} 1 & 2\omega \\ \omega & \omega^2 \end{vmatrix}$, then Δ^2 is equal to

(a) $-\omega$ (b) ω

(c) 1 (d) ω^2

106. If $\Delta_1 = \begin{vmatrix} 1 & 0 \\ a & b \end{vmatrix}$ and $\Delta_2 = \begin{vmatrix} 1 & 0 \\ c & d \end{vmatrix}$, then $\Delta_2 \Delta_1$ is equal to

(a) *ac* (b) *bd*

(c) $(b-a)(d-c)$ (d) None of these

107.If A_1, B_1, C_1.... are respectively the co-factors of the elements a_1, b_1, c_1,...... of the determinant

$\Delta = \begin{vmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{vmatrix}$, then $\begin{vmatrix} B_2 & C_2 \\ B_3 & C_3 \end{vmatrix} =$

(a) $a_1 \Delta$ (b) $a_1 a_3 \Delta$

(c) $(a_1 + b_1)\Delta$ (d) None of these

108. Let $A=[a_{ij}]_{n\times n}$ be a square matrix and let c_{ij} be cofactor of a_{ij} in *A*. If $C=[c_{ij}]$,then

(a) $|C|=|A|$ (b) $|C|=|A|^{n-1}$

(c) $|C|=|A|^{n-2}$ (d) None of these

109. $\begin{vmatrix} \log_2 512 & \log_4 3 \\ \log_3 8 & \log_4 9 \end{vmatrix} \times \begin{vmatrix} \log_2 3 & \log_8 3 \\ \log_3 4 & \log_3 4 \end{vmatrix}$

a) 7 (b) 10 (c) 13 (d) 17

110. If $A=\begin{vmatrix} 5 & 6 & 3 \\ -4 & 3 & 2 \\ -4 & -7 & 3 \end{vmatrix}$, then cofactors of the elements of 2nd row are

(a) $39,-3,11$ (b) $-39,3,11$

(c) $-39,27,11$ (d) $-39,-3,11$

111. The minors of – 4 and 9 and the co-factors of – 4 and 9 in determinant $\begin{vmatrix} -1 & -2 & 3 \\ -4 & -5 & -6 \\ -7 & 8 & 9 \end{vmatrix}$ are respectively

(a) 42, 3 ; – 42, 3 (b) –42, –3 ; 42, (c)42, 3 ; – 42, – 3 (d) 42, 3; 42, 3

112. $x+ky-z=0, 3x-ky-z=0$ and $x-3y+z=0$ has non-zero solution for *k* =

(a) – 1 (b) 0 (c) 1 (d) 2

113. The number of solutions of equations $x+y-z=0$, $3x-y-z=0, x-3y+z=0$ is

(a) 0 (b) 1

(c) 2 (d) Infinite

114. If $x+y-z=0, 3x-\alpha y-3z=0,\ x-3y+z=0$ has non zero solution, then $\alpha=$

(a) – 1 (b) 0

(c) 1 (d) – 3

115. The number of solutions of the equations $x+4y-z=0,\ 3x-4y-z=0, x-3y+z=0$ is

(a) 0 (b) 1

(c) 2 (d) Infinite

116. The roots of the equation $\begin{vmatrix} 1 & 4 & 20 \\ 1 & -2 & 5 \\ 1 & 2x & 5x^2 \end{vmatrix}=0$ are

(a) $-1,-2$ (b) $-1,2$ (c) $1,-2$ (d) $1,2$

ANSWERS

1	B	2	D	3	A	4	C	5	B
6	B	7	B	8	C	9	C	10	D
11	C	12	D	13	A	14	C	15	D
16	C	17	D	18	A	19	D	20	D
21	C	22	C	23	C	24	B	25	B
26	A	27	D	28	C	29	D	30	A
31	B	32	B	33	D	34	C	35	B
36	C	37	B	38	B	39	C	40	A
41	D	42	D	43	C	44	A	45	C
46	A	47	A	48	A	49	D	50	B
51	D	52	A	53	B	54	B	55	C
56	B	57	D	58	A	59	A	60	C
61	B	62	A	63	C	64	A	65	D
66	B	67	A	68	C	69	D	70	D
71	C	72	C	73	A	74	C	75	A
76	D	77	B	78	D	79	B	80	B
81	A	82	B	83	C	84	B	85	D
86	C	87	C	88	C	89	A	90	D
91	D	92	D	93	C	94	B	95	C
96	B	97	C	98	B	99	A	100	C
101	D	102	D	103	B	104	D	105	B
106	B	107	A	108	B	109	B	110	C
111	B	112	C	113	D	114	B	115	B
116	B								