Data Science & AI   Hinglish

Subject : Linear Algebra

DPP-01

1. Let A be a 5×8 matrix, then each column of A contains.
(a) 5 elements (b) 8 elements
(c) 40 elements (d) 13 elements

2. If A is a matrix of order 10×5, then each row of A contains-
(a) 25 elements (b) 15 elements
(c) 10 elements (d) 150 elements

3. The number of all possible matrices of order 2×3 with each entry 1 or –1 is-
(a) 32 (b) 12
(c) 6 (d) 64

4. If A is of order $m \times n$ and B is of order $p \times q$, then AB is defined only if
(a) $m = q$ (b) $m = p$
(c) $n = p$ (d) $n = q$

5. If P is of order 2×3 and Q is of order 3×2, then PQ is of order
(a) 2×3 (b) 2×2
(c) 3×2 (d) 3×3

6. If $A = \begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 1 & 0 & 0 \end{bmatrix}$, then
(a) $A^2 = 0$ (b) $A^2 = A$
(c) $A^3 = A$ (d) $A^2 = 2A$

7. If $A = [x, y, z]$ $B = \begin{bmatrix} a & h & g \\ h & b & f \\ g & f & c \end{bmatrix}$, $C = [\alpha, \beta, \gamma]^T$, then ABC is-
(a) Not defined
(b) is a 3×3 matrix
(c) is a 1×1 matrix
(d) is a 3×3 matrix

8. If $A + B = \begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix}$ and $A - 2B = \begin{bmatrix} -1 & 1 \\ 0 & -1 \end{bmatrix}$, then A is equal to
(a) $\frac{1}{3}\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$ (b) $\frac{1}{3}\begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix}$
(c) $\begin{bmatrix} 1 & 1 \\ 2 & 1 \end{bmatrix}$ (d) $\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$

9. If $x + \begin{bmatrix} 2 & 1 \\ 6 & 1 \end{bmatrix} = \begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$, then 'X' is equal to
(a) $\begin{bmatrix} 0 & 1 \\ 0 & 6 \end{bmatrix}$ (b) $\begin{bmatrix} 0 & -1 \\ 0 & -6 \end{bmatrix}$
(c) $\begin{bmatrix} -1 & 0 \\ -6 & 0 \end{bmatrix}$ (d) $\begin{bmatrix} 1 & 0 \\ 6 & 0 \end{bmatrix}$

10. If $A = \begin{bmatrix} 1 & 2 & 3 \\ -2 & 5 & 7 \end{bmatrix}$ and $2A - 3B = \begin{bmatrix} 4 & 5 & -9 \\ 1 & 2 & 3 \end{bmatrix}$, then B is equal to
(a) $\frac{1}{3}\begin{bmatrix} -2 & -1 & 15 \\ 5 & 8 & -11 \end{bmatrix}$ (b) $\begin{bmatrix} 2 & 1 & -15 \\ 5 & -8 & -11 \end{bmatrix}$
(c) $\begin{bmatrix} 2 & -1 & 15 \\ 5 & 8 & 11 \end{bmatrix}$ (d) $-\frac{1}{3}\begin{bmatrix} 2 & 1 & -15 \\ 5 & -8 & -11 \end{bmatrix}$

11. 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
(a) $x = -1, y = 0$ (b) $x = 1, y = 0$
(c) $x = 0, y = 1$ (d) $x = 1, y = 1$

12. Let $A = \begin{bmatrix} 2 & 3 & 5 \\ 1 & 0 & 2 \\ 3 & 4 & 5 \end{bmatrix}$ and $A + B - 4I = 0$, then B is equal to
(a) $\begin{bmatrix} 2 & -3 & -5 \\ -1 & 4 & -2 \\ -3 & -4 & -5 \end{bmatrix}$ (b) $\begin{bmatrix} 2 & 3 & 5 \\ 1 & -4 & 2 \\ 3 & 4 & 1 \end{bmatrix}$

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

13. If a diagonal matrix is commutative with every matrix of the same order then it is necessarily
(a) A diagonal matrix with at least two diagonal elements different.
(b) A scalar matrix
(c) A unit matrix
(d) A diagonal matrix with exactly two diagonal elements different.

14. $\begin{bmatrix} 7 & 1 & 2 \\ 9 & 2 & 1 \end{bmatrix}\begin{bmatrix} 3 \\ 4 \\ 5 \end{bmatrix} + 2\begin{bmatrix} 4 \\ 5 \end{bmatrix}$ is equal to

(a) $\begin{bmatrix} 45 \\ 44 \end{bmatrix}$ (b) $\begin{bmatrix} 43 \\ 45 \end{bmatrix}$

(c) $\begin{bmatrix} 44 \\ 43 \end{bmatrix}$ (d) $\begin{bmatrix} 43 \\ 50 \end{bmatrix}$

15.. If $f(x) = x^2 + 4x - 5$ and $A = \begin{bmatrix} 1 & 2 \\ 4 & -3 \end{bmatrix}$, then $f(A)$ is equal to-

(a) $\begin{bmatrix} 0 & -4 \\ 8 & 8 \end{bmatrix}$ (b) $\begin{bmatrix} 2 & 1 \\ 2 & 0 \end{bmatrix}$

(c) $\begin{bmatrix} 1 & 1 \\ 1 & 0 \end{bmatrix}$ (d) $\begin{bmatrix} 8 & 4 \\ 8 & 0 \end{bmatrix}$

16. If A is a square matrix such that $A^2 = I$, then A^{-1} is equal to-
(a) I (b) 0
(c) A (d) I + A

17. Let A $\begin{bmatrix} 1 & x/n \\ -x/n & 1 \end{bmatrix}$, then $\lim_{n\to\infty} A^n$ is-

(a) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ (b) $\begin{bmatrix} \cos x & \sin x \\ -\sin x & \cos x \end{bmatrix}$

(c) $\begin{bmatrix} \cos x & -\sin x \\ \sin x & \cos x \end{bmatrix}$ (d) $\begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix}$

18. Let $A = \begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$ and $P = \begin{bmatrix} \cos\pi/6 & \sin\pi/6 \\ -\sin\pi/6 & \cos\pi/6 \end{bmatrix}$ and $Q = PAP^T$, then $P^TQ^{2013}P$

(a) $\begin{bmatrix} 1 & 2013 \\ 0 & 1 \end{bmatrix}$ (b) $\begin{bmatrix} 0 & 2013 \\ 0 & 1 \end{bmatrix}$

(c) $\begin{bmatrix} 2013 & 0 \\ 0 & 2013 \end{bmatrix}$ (d) $\begin{bmatrix} 0 & 2013 \\ 2013 & 0 \end{bmatrix}$

19. If A is square matrix, then A is symmetric, iff
(a) $A^2 = A$ (b) $A^2 = I$
(c) $A^T = A$ (d) $A^T = -A$

20. If A is a square matrix, then A is skew symmetric iff-
(a) $A^2 = A$ (b) $A^2 = I$
(c) $A^T = A$ (d) $A^T = -A$

21. If A is any square matrix, then
(a) $A + A^T$ is skew symmetric
(b) $A - A^T$ is symmetric
(c) $A A^T$ is symmetric
(d) AA^T is skew symmetric

22. Each diagonal element of a skew symmetric matrix is-
(a) Zero
(b) Positive and equal
(c) Negative and equal
(d) Any real number

23.. Let A be the set of all 3 × 3 matrices which are symmetric with entries 0 or 1. If there are five I's and four 0's then number of matrices in A
(a) 6 (b) 12
(c) 9 (d) 58

24. Let $P = \begin{bmatrix} 1 & 0 & 0 \\ 4 & 1 & 0 \\ 16 & 4 & 1 \end{bmatrix}$ and l be the identity matrix of order 3. If $Q = [q_{ij}]$ is a matrix such that $P^{50} - Q = 1$, then $\frac{q_{31} + q_{32}}{q_{21}}$ equals.
(a) 52 (b) 103
(c) 201 (d) 205

25. If A is a singular matrix, then adj A is
(a) Singular (b) Non-singular
(c) Symmetric (d) Non defined

26. Which of the following is not true?
(a) Every skew-symmetric matrix of odd order is non-singular
(b) If determinant of a square matrix is non-zero, then the it is non-singular
(c) Adjoint of symmetric matrix is symmetric
(d) Adjoint of diagonal matrix is diagonal

27. If k is a scalar and I is a unit matrix of order 3, then adj (kI) =
(a) $k^3 I$ (b) $k^2 I$
(c) $-k^3 I$ (d) $-k^2 I$

28. Which of the following is/are true?
(i) Adjoint of a symmetric matrix is symmetric
(ii) Adjoint of a unit matrix isa unit matrix
(iii) A(adj A)= (adjA) A=|A|$I$and
(iv) Adjoint of a diagonal matrix is a diagonal matrix
(a) (i)
(b) (ii)
(c) (iii) & (iv)
(d) None of these

29. The adjoint of $\begin{bmatrix} 1 & 1 & 1 \\ 1 & 2 & -3 \\ 2 & -1 & 3 \end{bmatrix}$ is

(a) $\begin{bmatrix} 3 & -9 & -5 \\ -4 & 1 & 3 \\ -5 & 4 & 1 \end{bmatrix}$ (b) $\begin{bmatrix} 3 & -4 & -5 \\ -9 & 1 & 4 \\ -5 & 3 & 1 \end{bmatrix}$

(c) $\begin{bmatrix} -3 & 4 & 1 \\ 0 & 1 & 2 \\ 0 & 0 & 1 \end{bmatrix}$ (d) None of these

30. The inverse of $\begin{bmatrix} 1 & 2 & 3 \\ 0 & 1 & 2 \\ 0 & 0 & 1 \end{bmatrix}$ is-

(a) $\begin{bmatrix} 1 & -2 & 1 \\ 0 & 1 & -2 \\ 0 & 0 & 0 \end{bmatrix}$ (b) $\begin{bmatrix} 1 & -2 & 1 \\ 0 & 1 & -2 \\ 0 & 0 & 1 \end{bmatrix}$

(c) $\begin{bmatrix} 1 & 2 & 1 \\ 0 & 1 & 2 \\ 0 & 0 & 1 \end{bmatrix}$ (d) None of these

31. If A and B are non-singular square matrix of same order, then adj(AB) is equal to
(a) (adj A)(adj B)
(b) (adj B) (adj A)
(c) (adj B^{-1})(adj A^{-1})
(d) (adj A^{-1}) (adj B^{-1})

32. If I_3 is the identity matrix of orders, the value of $(I_3)^{-1}$ is:
(a) 0
(b) $3I_3$
(c) I_3
(d) Does not exist

33. For two invertible matrices A and B of suitable orders, then value of $(AB)^{-1}$ is:
(a) $(BA)^{-1}$ (b) $B^{-1} A^{-1}$
(c) $A^{-1} B^{-1}$ (d) $(AB')^{-1}$

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

35. $A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 1 \\ 0 & -2 & 4 \end{bmatrix}; 1 \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$, $A^{-1} = \frac{1}{6}[A^2 + cA +$ dI], where c, d $\in$R, then pair of values (c, d)
(a) (6, 11) (b) (6, 11)
(c) (–6, 11) (d) (–6, –11)

36. Let $A = \begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$, then |2A| is equal to
(a) 4 cos2θ (b) 1
(c) 2 (d) 4

37. If ω is non-real complex cube root of unit, then the determinant of the matrix A is defined as

$\begin{bmatrix} 1 & \omega & \omega^2 \\ \omega & \omega^2 & 1 \\ \omega^2 & \omega & 1 \end{bmatrix}$ is equal to

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

38. The value of the determinant of the matrix A= $\begin{bmatrix} 1 & x & x^3 \\ 1 & y & y^3 \\ 1 & z & z^3 \end{bmatrix}$ is equal to

(a) $(x-y)(y-z)(z-x)$
(b) $(x-y)(y-z)(z-x)(x+y+z)$
(c) $(x+y+z)$
(d) $(x-y)(y-z)(z-x)(xy+yz+zx)$

39. If A is 3 × 3 matrix and $|A| = 4$, then $|A^{-1}|$ is equal to-

(a) $\frac{1}{4}$ (b) $\frac{1}{16}$
(c) 4 (d) 2

40. The number of real roots of the equation $|A|= 0$ where A is defined as $\begin{bmatrix} x & -6 & -1 \\ 2 & -3x & x-3 \\ -3 & 2x & x+2 \end{bmatrix}$

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

41. If $|A|= 0$ where A is defined as the matrix $\begin{bmatrix} 4 & -4 & 0 \\ a & b+4 & c \\ a & b & c+4 \end{bmatrix}$, then a + b + c is equal to

(a) 41 (b) 116
(c) 628 (d) – 4

42. The equation $|A|= 0$ where A is defined as $\begin{bmatrix} x-2 & 3 & 1 \\ 4x-2 & 10 & 4 \\ 2x-1 & 5 & 1 \end{bmatrix}$ is satisfied by

(a) $x=-2$ (b) $x=-5$
(c) $x=-7$ (d) $x=-9$

43. The determinant of the matrix A= $\begin{bmatrix} x & 4 & y+z \\ y & 4 & z+x \\ z & 4 & x+y \end{bmatrix}$ is equal to

(a) $4x$ (b) $x+y+z$
(c) xyz (d) 0

44. The value of the determinant A= $\begin{bmatrix} 1 & a & a^2-bc \\ 1 & b & b^2-ca \\ 1 & c & c^2-ab \end{bmatrix}$

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

45. The roots of the equation $|A|= 0$ where A is defined as $\begin{bmatrix} x-1 & 1 & 1 \\ 1 & x-1 & 1 \\ 1 & 1 & x-1 \end{bmatrix}$

(a) 1, 2 (b) 1,–2
(c) -1,–2 (d) –1, 2

46. The value of the determinant of the matrix $\begin{bmatrix} 1 & \log_b a \\ \log_a b & 1 \end{bmatrix}$ is equal to-

(a) 1 (b) $\log_a b$
(c) $\log_b a$ (d) 0

47. Find the $|A|$,where A is defined as $\begin{bmatrix} 11+a & c & 1+bc \\ 11+a & d & 1+bd \\ 11+a & e & 1+be \end{bmatrix}$ is equal to

(a) 1 (b) 0
(c) 3 (d) $a+b+c$

48. If $|A|= ka^2b^2c^2$ where A is defined as $\begin{bmatrix} -a^2 & ab & ac \\ ab & -b^2 & bc \\ ac & bc & -c^2 \end{bmatrix}$, then k is equal to

(a) 2 (b) 4
(c) –4 (d) 8

49. Let $f(x) = |A|$ where A is defined as the matrix $\begin{bmatrix} 1 & x & x+1 \\ 2x & x(x-1) & (x-1)x \\ 3x(x-1) & x(x-1)(x-2) & (x+1)x(x-1) \end{bmatrix}$ then $f(100)$ is equal to -

(a) 0 (b) 1

(c) 100 (d) –100

50. The roots of the equation |A|=0 where A is defined as $\begin{bmatrix} 1 & 4 & 20 \\ 1 & -2 & 5 \\ 1 & 2x & 5x^2 \end{bmatrix}$ are

(a) –1, –2 (b) –1, 2
(c) 1, –2 (d) 1, 2

51. If A^2 = 8A + KI where A = $\begin{bmatrix} 1 & 0 \\ -1 & 7 \end{bmatrix}$, then k is

(a) 7 (b) –7
(c) 1 (d) –1

52. The value of the determinant of matrix A where A is defined as A= $\begin{bmatrix} {}^5C_0 & {}^5C_3 & 14 \\ {}^5C_1 & {}^5C_4 & 1 \\ {}^5C_2 & {}^5C_5 & 1 \end{bmatrix}$ is

(a) 0 (b) –(6!)
(c) 80 (d) – 576

53. If

$\Delta_1 is\ the\ determinant\ of\ matrix \begin{bmatrix} 10 & 4 & 3 \\ 17 & 7 & 4 \\ 4 & -5 & 7 \end{bmatrix}$

and $\Delta_2 is\ the\ determinant\ of\ the\ matrix$

$\begin{bmatrix} 4 & x+5 & 3 \\ 7 & x+12 & 4 \\ -5 & x-1 & 7 \end{bmatrix}$ such that $\Delta_1 + \Delta_2 = 0$, then

(a) $x = 0$
(b) x has no real value
(c) $x = 0$
(d) $x = 1$

54. If all elements of a third order determinant are equal to 1 or –1, then determinant itself is-

(a) An odd integer
(b) An even integer
(c) An imaginary number
(d) Multiple of 3

55. If A is a 3×3 matrix and det (3A) = k {det (A)}, then k is-

(a) 9 (b) 6
(c) 1 (d) 27

56. If A is any of square matrix of order n, then A(adjA) is equal to

(a) 1 (b) $|A|.I_n$
(c) 0 (d) $|A|^n$

57. If A is a square matrix of order 3, |A| =3 then |adj adj A| is equal to -

(a) 3^5 (b) 3^7
(c) 9 (d) 81

58. If A = $\begin{bmatrix} 11 & 7 \\ -13 & 17 \end{bmatrix}$, then adj (adj A) is

(a) $\begin{bmatrix} 17 & -7 \\ 13 & 11 \end{bmatrix}$ (b) $\begin{bmatrix} 11 & 7 \\ -13 & 17 \end{bmatrix}$

(c) $\begin{bmatrix} -17 & 7 \\ 13 & -11 \end{bmatrix}$ (d) $\begin{bmatrix} -11 & 7 \\ -13 & 17 \end{bmatrix}$

59. If A = $\begin{bmatrix} \sin\alpha & -\cos\alpha & 0 \\ \cos\alpha & \sin\alpha & 0 \\ 0 & 0 & 1 \end{bmatrix}$, then A^{-1} is equal to

(a) $-A^T$ (b) A
(c) adjA (d) A^2

60. If A is a matrix of order 3 and |A| = 2, then |adj A| is-

(a) 1 (b) 2
(c) 8 (d) 4

61. 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) A is zero matrix
(b) A = (–1)/3
(c) A^{-1} doesn't exist
(d) $A^2 = 1$

62. A is a matrix of order 3 × 3. If A' = A and five entries in the matrix are of one kind and remaining four are of another kind, then the maximum number of such matrices is greater then of equal to-

(a) 9 (b) 10
(c) 11 (d) 8

63. If the adjoint of a 3×3 matrix P is $\begin{bmatrix} 1 & 4 & 4 \\ 2 & 1 & 7 \\ 1 & 1 & 3 \end{bmatrix}$,then the possible value (s) of the determinant of P is (are)-

(a) –2 (b) –1
(c) 1 (d) 2

64. Let P = $\begin{bmatrix} 3 & -1 & -2 \\ 2 & 0 & \alpha \\ 3 & -5 & 0 \end{bmatrix}$, where $\alpha \in \mathbb{R}$. Suppose Q = $[q_{ij}]$ is a matrix such that PQ = Kl, where k$\in \mathbb{R}$, k $\neq 0$ and l is the identity matrix of order 3. If $q_{23} = \frac{k}{8}$ and $\det(Q) = \frac{k^2}{2}$, then

(a) $\alpha = 0, k = 8$
(b) $4\alpha - k + 8 = 0$
(c) $\det(P \text{ adj } (Q)) = 2^9$
(d) $\det(Q \text{ adj}(P)) = 2^{13}$

65. A and B are two matrices for same order 3 × 3, where

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 4 \\ 5 & 6 & 8 \end{bmatrix}, B = \begin{bmatrix} 3 & 2 & 5 \\ 2 & 3 & 5 \\ 7 & 2 & 9 \end{bmatrix}$$

Choose the correct answer:

1. The value of adj(adj A) is,
(a) –A (b) 4A
(c) 8A (d) 16A

2. The value of |adj (AB)| is
(a) 24 (b) 24^2
(c) 24^3 (d) 65

3. Value of |adj(adj(adj(adjA)))| is
(a) 2^4 (b) 2^9
(c) 1 (d) 2^{19}

66. Let P be the set of all 3×3 symmetric matrices all of whose entries are either 0 or 1. Five of these are 1 and four of them are 0.

1. The number of matrices in /is:
(a) 12 (b) 6
(c) 9 (d) 3

2. The number of A in P for which the system of linear equations

$$A\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$$

Has a unique solution, is
(a) Less than 4
(b) At least 4 but less than 7
(c) At least 7 but less than 10
(d) At least 10

3. The number of matrices A in A for which for which the system on linear equations $A\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$

is inconsistent, is
(a) 0
(b) More than 2
(c) 2
(d) 1

67. The total number of distinct $x \in \mathbb{R}$ which $\begin{vmatrix} x & x^2 & 1+x^3 \\ 2x & 4x^2 & 1+8x^3 \\ 3x & 9x^2 & 1+27x^3 \end{vmatrix} = 10$ is-

68. The matrices which commute with A = $\begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$ in case of multiplication.
STATEMENT -1 Are always singular
STATEMENT -2 Are always singular
STATEMENT -3 Are always singular
(a) F F F (b) T T F
(c) T T T (d) T F T

69. Number or real roots equation |A|=0 where A is defined as $\begin{bmatrix} x^2 & -4 & -2 \\ 4 & x^2 & 1 \\ -5 & 3 & x^2 \end{bmatrix}$ are
(a) 0 (b) 1
(c) 2 (d) 4

70. The coefficient of x in $f(x)$ = det of A where A is defined as

$\begin{bmatrix} x & 1+\sin x & \cos x \\ 1 & \log(1+x) & 2 \\ x^2 & 1+x^2 & 0 \end{bmatrix}$ where $-1 < x \leq 1$, is
(a) 1 (b) –2
(c) –1 (d) 0

71. If adj B = A, |P| = |Q| =1, then adj $(Q^{-1}BP^{-1})$ equals

(a) PQ (b) QAP
(c) PAQ (d) $PA^{-1}Q$

72. The matrix $A = \begin{bmatrix} 2 & -1 & 1 \\ -2 & 3 & -2 \\ -4 & 4 & -3 \end{bmatrix}$ is

(a) Orthogonal (b) Nilpotent
(c) Idempotent (d) Involutary

73. The matrix $A = \begin{bmatrix} a & 2 \\ 2 & 4 \end{bmatrix}$ is singular if

(a) $a \neq 1$ (b) $a = 1$
(c) $a = 0$ (d) $a = -1$

74. $A = \begin{bmatrix} 1 & 0 & k \\ 2 & 1 & 3 \\ k & 0 & 1 \end{bmatrix}$ is invertible for

(a) $k = 1$ (b) $k = -1$
(c) $k \neq \pm 1$ (d) $k = 0$

Answer Key

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

52. (d)
53. (a)
54. (b)
55. (d)
56. (b)
57. (d)
58. (b)
59. (c)
60. (d)
61. (d)
62. (1,2,3,4)
63. (1,4)
64. (2, 3)
65.1- (a)
2-(b)
3-(c)
66. **1-**(a)
2- (b)
3-(b)
67. 2
68. (a)
69. (c)
70. (b)
71. (c)
72. (c)
73. (b)
74. (c)

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