Practical No-1: System of Linear Equations and Matrices

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September 12, 2021

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1. Information in science, business and mathematics is often organized into rows and columns to form rectangular arrays called:
   - **a)** Matrices
   - **b)** Determinant
   - **c)** System of Linear Equations
   - **d)** None of the above

   Answer: (a)

2. If a matrix is in reduced row echelon form, then it is also in row echelon form:
   - **a)** False
   - **b)** True
   - **c)** May be
   - **d)** None of the above

   Answer: (b)

3. A system of linear equations is said to b homogeneous if the constant terms are all:
   - **a)** One
   - **b)** Zero
   - **c)** Both (a) and (b)
   - **d)** None of the above

   Answer: (b)

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4. A homogeneous linear system always has the trivial solution, there are only two possibilities for its solutions:
   a) The system has only the trivial solution.
   b) The system has infinitely many solutions in addition to the trivial solution.
   c) Both (a) and (b)
   d) None of the above

Answer: (c)

5. A matrix with only one column is called:
   a) A Null matrix.
   b) A row matrix.
   c) Homogeneous matrix.
   d) None of the above

Answer: (d)

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6. A set of linear equations is represented by the matrix equation Ax=b. The necessary condition for the existence of a solution for this system is:
   a) A must be invertible.
   b) b must be linearly depended on the columns of A.
   c) b must be linearly independent of the columns of A.
   d) None of the above

Answer: (b)

7. Indication of number of rows and number of columns in a matrix is classified as:
   a) Direction.
   b) Classification.
   c) Specification.
   d) None of the above

Answer: (d)

8. Value of determinant is computed by adding multiples of one row to:
   a) Another dimension.
   b) Another row.
   c) Another column.
   d) None of the above

Answer: (b)

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9. In square matrix, all elements other than elements along primary diagonal are:

- **a)** Equal to zero.
- **b)** Equal to two.
- **c)** Equal to one.
- **d)** None of the above

Answer: (a)

10. According to determinant properties, multiple of one row is added to another row then determinant:

- **a)** Changed.
- **b)** Unchanged.
- **c)** Multiplied.
- **d)** None of the above

Answer: (b)

11. Method in which rows and columns are cross off and minor determinants are involved is classified as:

- **a)** Method of three factors.
- **b)** Method of one factor.
- **c)** Method of cofactors.
- **d)** None of the above

Answer: (c)

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12. In Gaussian reduction procedure, row operations are performed to transform matrix A into:

- **a)** (m x m) identity matrix.
- **b)** (n x n) identity matrix.
- **c)** (f x p) identity matrix.
- **d)** None of the above

Answer: (a)

13. Matrix having same number of columns and rows is classified as:

- **a)** Triangle matrix.
- **b)** Rectangle matrix.
- **c)** Circle matrix.
- **d)** None of the above

Answer: (d)

14. Dimension of matrix with 6 columns and 4 rows is:

- **a)** 6x4.
- **b)** 6+4.
- **c)** 4x6.
- **d)** None of the above

Answer: (c)

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15. Result of inverse will be one only when quantity b is multiplied by:

- **a)** Reciprocal b/2.
- **b)** Reciprocal 2/b.
- **c)** Reciprocal 1/b.
- **d)** None of the above

Answer: (c)

16. In adjacency matrix, each node has one row and:

- **a)** One column.
- **b)** Two columns.
- **c)** Three columns.
- **d)** None of the above

Answer: (a)

17. In Gaussian reduction procedure, matrix A is augmented with an identity (m x m) as:

- **a)** (A | N)
- **b)** (A | I)
- **c)** (A | B)
- **d)** None of the above

Answer: (b)

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18. Method in which matrix rows are selected and multiply corresponding cofactors to yield determinant is called:

- **a)** Three factor expansion.
- **b)** One factor expansion.
- **c)** Cofactor expansion.
- **d)** None of the above

Answer: (c)

19. In computation of determinant of a matrix, significant efficiencies are introduced by combining row to another which:

- **a)** Contains subtraction.
- **b)** Contains zero.
- **c)** Contains addition.
- **d)** None of the above

Answer: (b)

20. After performing row operations on augmented matrix A in Gaussian reduction procedure then resulting matrix is:

- **a)** $(B^{-1} | I)$
- **b)** $(I | A^{-1})$
- **c)** $(M | B^{-1})$
- **d)** None of the above

Answer: (b)

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21. Two equations that can be drawn as same line on graph then these equations are considered as:

- **a)** Constant equations
- **b)** Solved equations
- **c)** Non-Equivalent equations
- **d)** Equivalent equations

Answer: (d)

22. Number of ordered pair values (x, y) to satisfy linear equation ax + by =c are:

- **a)** Finite
- **b)** Infinite
- **c)** Zero
- **d)** None of the above

Answer: (a)

23. Set which consists of more than one equation is classified as:

- **a)** System of variables.
- **b)** System of equations.
- **c)** System of constants.
- **d)** None of the above.

Answer: (b)

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24. In linear equations, finite set and infinite set are classified as its:

- **a)** Dimension set.
- **b)** Constant set.
- **c)** Solution set.
- **d)** None of the above.

Answer: (c)

25. Method in which both sides of equation are multiplied by nonzero constant is classified as:

- **a)** Gaussian elimination method.
- **b)** Gaussian inconsistent procedure.
- **c)** Gaussian consistent procedure.
- **d)** None of the above.

Answer: (a)

26. In Gaussian elimination method, original equations are transformed by using:

- **a)** Column operations.
- **b)** Mathematical operations.
- **c)** Row operations
- **d)** None of the above.

Answer: (c)

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27. Transpose of a rectangular matrix is a:

- **a)** Rectangular matrix.
- **b)** Diagonal matrix.
- **c)** Square matrix.
- **d)** Scalar matrix.

Answer: (a)

28. Two matrices A and B are multiplied to get AB if:

- **a)** Both are rectangular.
- **b)** Both have same order.
- **c)** No. of rows of A is equal to no. of columns of B.
- **d)** None of the above.

Answer: (d)

29. If $|A|=0$, then A is:

- **a)** Zero matrix.
- **b)** Singular matrix.
- **c)** Non-singular matrix.
- **d)** None of the above.

Answer: (b)

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30. If A is a symmetric matrix, then A^T =

- **a)** A.
- **b)** |A|.
- **c)** Diagonal matrix.
- **d)** None of the above.

Answer: (a)

31. In a matrix multiplication for A and B, $(AB)^T$ =

- **a)** $A\,B^T$
- **b)** $B^T\,A^T$.
- **c)** 1/AB
- **d)** None of the above.

Answer: (b)

32. For a non-trivial solution |A| is:

- **a)** $|A| > 0$
- **b)** $|A| < 0$
- **c)** $|A| = 0$
- **d)** None of the above.

Answer: (c)

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33. For any non-singular matrix A, A^{-1} =

- **a)** Adj A/ |A|
- **b)** 1/ Adj A/ |A|
- **c)** |A| adj A
- **d)** None of the above.

Answer: (a)

34. A matrix having m rows and n columns with $m \neq n$ is said to be a

- **a)** Square matrix.
- **b)** Identity matrix.
- **c)** Rectangular matrix.
- **d)** None of the above.

Answer: (c)

35. [a b c] is a:

- **a)** Zero matrix.
- **b)** Diagonal matrix.
- **c)** Column matrix.
- **d)** Row matrix.

Answer: (d)

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36. Two matrices A and B are added if:

- **a)** Both are rectangular.
- **b)** Both have same order.
- **c)** No. of columns of A is equal to columns of B.
- **d)** No. of rows of A is equal to no. of columns of B.

Answer: (b)

37. If AB exists, then $(AB)^{-1}$ is:

- **a)** AB.
- **b)** $B^{-1}A$
- **c)** $B^{-1}A^{-1}$
- **d)** None of the above

Answer: (c)

38. If A is a skew symmetric matrix, then A^T is:

- **a)** -A
- **b)** A
- **c)** 0
- **d)** None of the above

Answer: (a)

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39. Equations having a common solution are called:

- **a)** Linear equations.
- **b)** Homogeneous equations.
- **c)** Simultaneous equations
- **d)** None of the above

Answer: (c)

40. If A and B are square matrices of sizes n x n, then which of the following statement is not true?

- **a)** $\det(AB) = \det(A)\det(B)$
- **b)** $\det(A+B) = \det(A) + \det(B)$
- **c)** $\det(kA) = k^n \det(A)$
- **d)** None of the above

Answer: (b)

41. Eigenvalues of a square matrix are always:

- **a)** Positive.
- **b)** Real and imaginary.
- **c)** Negative.
- **d)** Real.

Answer: (d)

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42. If A and B are non-zero square matrices, then AB=0 implies:

- **a)** A and B are orthogonal.
- **b)** A and B are singular.
- **c)** A is singular.
- **d)** None of the above

Answer: (a)

43. If A and B be real symmetric matrices of size n x n, then:

- **a)** $AA^T=1$
- **b)** $A=A^{-1}$.
- **c)** $AB = BA$
- **d)** $(AB)^T = BA$

Answer: (d)

44. Rank of the matrix $\begin{bmatrix} 0 & 0 & -3 \\ 9 & 3 & 5 \\ 3 & 1 & 1 \end{bmatrix}$

- **a)** 0
- **b)** 1
- **c)** 2
- **d)** None of the above

Answer: (c)