CHAPTER 3

MATRICES

TRUE-FALSE QUESTIONS

Read the statements and state true and false.

1. If order of two matrices are same then addition is possible
2. The diagonal elements of skew symmetric matrix are necessarily zero
3. For all the matrices AB=BA
4. If $A^T = A$ then A is symmetric matrix
5. In a square matrix, if the all-diagonal elements are same then it is scalar matrix
6. Every square matrix can be expressed as sum of symmetric and skew symmetric matrices.
7. For every square matrix A, A.I=I.A = I
8. For two matrices A and B, if AB=BA=I, then B is inverse of A
9. If there are 5 elements then there are two different orders of matrices are exist:
10. If $A^2 = I$ then the inverse of A is A itself:
11. Identity matrix is a skew symmetric matrix.
12. Suppose that Ais an m×n matrix and B is an n×mmatrix. Then $(AB)^T = A^T B^T$
13. Addition of two matrices is possible only if both the matrices are of same order.
14. Suppose that A is an n×n matrix and assume A^2 =O, where O is the zero matrix. Then A=O.
15. If A, B are symmetric matrices of same order, then AB – BA is a skew symmetric matrix
16. If the product of two matrices AB is square matrix, then A and B must be square matrices.
17. AA^T is always a symmetric matrix for any matrix A.
18. The number of elements in an $m \times n$ matrix will be 2^{mn}
19. Matrix addition is commutative.
20. Suppose that A and B are n×n matrices. Then $(A + B) \cdot (A + B) = A^2 + 2AB + B^2$
21. If A and B are two matrices of same order then B-A=A-B
22. Matrices of different order cannot be subtracted
23. If A is a symmetric matrix then A² is a skew symmetric matrix
24. If each of the three matrix of the same order are symmetric then their sum is symmetric matrix
25. A matrix denotes a number
26. Matrix addition is associative as well as commutative
27. A square matrix where every element is unity is called a identity matrix
28. Two matrices are said to be equal if they have the same number of rows and same number of columns
29. Transpose of a column matrix is a column matrix
30. Matrix multiplication is commutative
31. Matrix multiplication is distributive over matrix addition

32. $\begin{bmatrix} 0 & -2 & 5 \\ 2 & 8 & 3 \\ -5 & -3 & 6 \end{bmatrix}$ is skew symmetric matrix

33. For any square matrix A,   A(Adj A)=|A|I

34. If A is singular matrix then adjA is also singular.

35. For any square matrix A,A^{-1} always exists

36. If $A = \begin{bmatrix} 1 & 2 \\ 2 & -1 \end{bmatrix}$ $then$ $A^{-1} = \frac{1}{5}\begin{bmatrix} 1 & 2 \\ 2 & -1 \end{bmatrix}$

37. If A is a square matrix of order 3 such that |adjA|=64, then |A|= -8

38. Matrices of any order can be added

39. If A and B are two square matrices of the same order, then A + B = B + A.

40. If A and B are two matrices of the same order, then A – B = B – A.

41. If matrix AB = O, then A = O or B = O or both A and B are null matrices.

42. A matrix which is not a square matrix is rectangular matrix

43. The elements of a null matrix may be 2

44. A row matrix has only one column

45. If P, Q are square matrices of order 3, P is a non- singular matrix and PQ =O, then Q is a null matrix

46. If a matrix has 10 elements, then it may have an order 10 x 10

47. We can multiply matrix A and matrix B if the no of columns of matrix A is not equal to the no of rows of matrix B

48. The no of all possible matrices of order 3 x 3 with each entry 1 or 0 is 512

49. A square matrix has all the elements zero

50. If A is a matrix of order p x n then the transpose of A is of order n x p.

51. If A and B are symmetric matrices of the same order, then AB + BA is a symmetric matrix

52. For any square matrix A, AA$^\mathsf{T}$ is a skew-symmetric matrix

53. For the matrices A,B,C of same order, A + B = B + A and A + (B + C) = (A + B) + C

54. If A is an m × n matrix such that AB and BA are both defined, then B is a m × n matrix

55. If A is a square matrix such that A² = I, then (A – I)³ + (A + I)³ – 7A is equal to A

56. If A and B are square matrices of the same order, then $(AB^{/} - BA^{/})$ is a symmetric matrix.

57. Multiplication of diagonal matrices of same order will be commutative.

58. If a matrix A is both symmetric and skew-symmetric, then A is a zero matrix

59. If A =$\begin{pmatrix} 1 & 3 \\ 3 & 4 \end{pmatrix}$ and A² – KA – 5I = 0, then K = 7

60. Total number of possible matrices of order 3 × 3 with each entry 2 or 0 is 512

61. Every matrix has a unique value.

62. Every square matrix has a unique inverse

63. Transpose of product of two matrices is equal to the product of the transpose of the matrices

64. Every non zero matrices can be written as a sum of a symmetric and skew symmetric matrices.

65. Every scalar matrix is an identity matrix.

66. For two matrices A and B, if AB=BA=I, then A is called inverse of B.

67. If the order of a matrix is prime, it must be a row or column matrix.

68. The entries of a matrix are always real or complex numbers

69. The sum of a skew symmetric matrix and its transpose is a zero matrix.

ANSWERS

1	T	2	T	3	F	4	T	5	F
6	T	7	F	8	T	9	T	10	T
11	F	12	F	13	T	14	F	15	T
16	F	17	T	18	F	19	T	20	F
21	F	22	T	23	F	24	T	25	F
26	T	27	F	28	F	29	F	30	F
31	T	32	F	33	T	34	T	35	F
36	T	37	T	38	F	39	T	40	F
41	F	42	T	43	F	44	F	45	F
46	F	47	F	48	T	49	F	50	T
51	T	52	F	53	T	54	F	55	T
56	F	57	T	58	T	59	T	60	T
61	F	62	F	63	F	64	F	65	F
66	T	67	T	68	T	69	T		

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