Saitechinfo NEET JEE Academy

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MATRICES UNIT TEST

Class 12 - Mathematics

Time Allowed: 1 hour **Maximum Marks: 25**

1. If A = $[a_{ij}]$ is a scalar matrix of order n $\times$ n such that a_{ij} = k for all i, then trace of A is equal to **[1]**

   a) nk b) $\frac{n}{k}$

   c) n - k d) n + k

2. If a matrix has 18 elements, then the number of its possible order is **[1]**

   a) 6 b) 2

   c) 4 d) 8

3. If a matrix has 36 elements, the number of possible orders it can have, is: **[1]**

   a) 13 b) 9

   c) 3 d) 5

4. The number of all possible matrices of order 2 $\times$ 3 with each entry 1 or 2 is **[1]**

   a) 16 b) 6

   c) 24 d) 64

5. Match the column: **[2]**

(a) The matrix equation is $\begin{bmatrix} x & 1 \end{bmatrix}$ = [2 1], then the value of x =	(i) 3
(b) If $\begin{bmatrix} x-y & z \\ 2x-y & w \end{bmatrix} = \begin{bmatrix} -1 & 4 \\ 0 & 5 \end{bmatrix}$ the value of x + y =	(ii) $\frac{7}{2}$
(c) The element a_{ij} of a 3$\times$3 matrix are given as $a_{ij} = \frac{1}{2}\lvert -3i+j \rvert$, the value of element a_{32} =	(iii) 4
(d) If $\begin{bmatrix} 2x & 4 \end{bmatrix}\begin{bmatrix} x \\ -8 \end{bmatrix}$ = 0, the positive value of x =	(iv) 2

6. Write the element a_{12} of the matrix A = $[a_{ij}]_{2\times 2}$, whose element a_{ij} are given by $a_{ij} = e^{2ix} \sin jx$. **[1]**

7. Consider the following information regarding the number of men and women workers in three factories I, II and III **[1]**

	Men workers	Women workers
I	30	25
II	25	31
III	27	26

Represent the above information in the form of a 3×2 matrix. What does the entry in the third row and second column represent?

8. Find the order of the matrix A such that $\begin{bmatrix} 2 & -1 \\ 1 & 0 \\ -3 & 4 \end{bmatrix} A = \begin{bmatrix} -1 & -8 \\ 1 & -2 \\ 9 & 22 \end{bmatrix}$. **[1]**

9. If a matrix has 24 elements, what are possible orders it can have? What, if it has 13 elements? **[1]**

10. Match the column: **[2]**

(a) A matrix of order m x n, such that m = n, is called	(i) Scalar Matrix
(b) In a square matrix, if all the elements except those in the leading diagonals are zero i.e.,a_{ij} = 0 for $i \neq j$	(ii) Unit/Identity Matrix
(c) A square matrix in which every non-diagonal element is zero and all diagonal elements are equal is called	(iii) Square Matrix
(d) A square matrix, in which every non-diagonal element is zero and every diagonal element is 1, is called,	(iv) Diagonal Matrix

11. Match the column: **[2]**

(a) A matrix having only one row and any number of columns is called a	(i) Rectangular Matrix
(b) A matrix having only one column and any number of rows is called a	(ii) Row Matrix
(c) A matrix of order m x n, such that m ≠ n, is called	(iii) null/zero matrix
(d) A matrix of any order, having all its elements are zero, is called a	(iv) Column Matrix

12. Given A = $\begin{bmatrix} 5 & 0 & 4 \\ 2 & 3 & 2 \\ 1 & 2 & 1 \end{bmatrix}$, $B^{-1} = \begin{bmatrix} 1 & 3 & 3 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{bmatrix}$, compute $(AB)^{-1}$ **[3]**

13. If A is a symmetric matrix and $n \in N$, write whether A^n is symmetric or skew-symmetric or neither of these two. **[2]**

14. Write a square matrix that is both symmetric as well as skew-symmetric. **[3]**

15. If A = $[a_{ij}]$ is a square matrix such that $a_{ij} = i^2 - j^2$, then write whether A is symmetric or skew-symmetric. **[3]**