



S.S. Divine School



Pre – Primary , Primary, Secondary & Higher Secondary

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Std: 12th (E.M)

Date:27/07/2022

Subject: MATHS (050)

Roll No:

Time: 1 hour

Max. Marks:25

Part -A

Answer the following questions very briefly. (Each carries 1 mark)

(1)

If $U = [2 \ -3 \ 4]$, $V = \begin{bmatrix} 3 \\ 2 \\ 1 \end{bmatrix}$, $x = [0 \ 2 \ 3]$, $Y = \begin{bmatrix} 2 \\ 2 \\ 4 \end{bmatrix}$ then $UV + XY =$ _____

- (A) 20 (B) [-20] (C) -20 (D) [20]

(2)

If $AB = A$ and $BA = B$, then $A^2 + B^2 =$ _____

- (A) $A + B$ (B) $-(A+B)$ (C) $2A+B$ (D) $A-2B$

(3)

Matrices of order 3×3 are there whose all elements are 2 and 0.

- (A) 9 (B) 27 (C) 81 (D) 512

(4)

Number of binary operations on the set $\{1, 2, 3, \dots, n\}$ is _____

- (A) 2^n (B) n^3 (C) n^{n^2} (D) n^{n^2}

(5)

Set A has 3 elements and B has 4 elements. The numbers of one-one function from A to B is...

- (A) 12 (B) 24 (C) 64 (D) 144

(6)

$A = \{1, 2, 3, 4\}$ A relation R on A is given by $R = \{(2, 2), (3, 3), (4, 4), (1, 2)\}$, then R is

- (A) Reflexive (B) Symmetric (C) Transitive (D) Equivalence

(7)

If A is 3×3 order square matrix, then $|KA| = \dots\dots\dots$; ($K > 0$)

- (A) $K|A|$ (B) $K^2|A|$ (C) $K^3|A|$ (D) $3K|A|$

(8)

If $A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$, then $A^2 + 2A = \dots\dots\dots$

- (A) $4A$ (B) $3A$ (C) $2A$ (D) A

(9)

If $A = \begin{bmatrix} \frac{1}{2} & \frac{1}{2} \\ \frac{1}{2} & \frac{1}{2} \end{bmatrix}$, then find A^2

- (A) $\begin{bmatrix} \frac{1}{4} & \frac{1}{4} \\ \frac{1}{4} & \frac{1}{4} \end{bmatrix}$ (B) $\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$ (C) $\begin{bmatrix} \frac{1}{2} & \frac{1}{2} \\ \frac{1}{2} & \frac{1}{2} \end{bmatrix}$ (D) $\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$

PART -B

Section-A

Answer the following questions (Each carries 2 marks)

(1)

For $A = \begin{bmatrix} -2 \\ 4 \\ 5 \end{bmatrix}$, $B = [1 \ 3 \ -6]$ verify that $(AB)^1 = B^1A^1$

(2)

If $2x + 3y = \begin{bmatrix} 2 & 3 \\ 4 & 0 \end{bmatrix}$ and $3x + 2y = \begin{bmatrix} 2 & -2 \\ -1 & 5 \end{bmatrix}$, then find X and Y.

(3)

For the matrix $A = \begin{bmatrix} 1 & -1 & 2 \\ 3 & 0 & -2 \\ 1 & 0 & 3 \end{bmatrix}$ find $\text{adj } A$.

Section-B

Answer the following questions as directed (Each carries 3 marks)

(1)

If $A = \begin{bmatrix} 1 & 0 & 2 \\ 0 & 2 & 1 \\ 2 & 0 & 3 \end{bmatrix}$, Prove that $A^3 - 6A^2 + 7A + 2I = 0$

(2)

For what value of x

$$\begin{bmatrix} 1 & 2 & 1 \end{bmatrix} \begin{bmatrix} 1 & 2 & 0 \\ 2 & 0 & 1 \\ 1 & 0 & 2 \end{bmatrix} \begin{bmatrix} 0 \\ 2 \\ x \end{bmatrix} = 0$$

Section -C

Answer the following question as directed. (Each carry 4 marks)

(1)

By use of elementary operation find inverse of matrix $\begin{bmatrix} 1 & 3 & -2 \\ -3 & 0 & -5 \\ 2 & 5 & 0 \end{bmatrix}$

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