

DBZ-003-2032004

Seat No. _____

B. C. A. (Sem. II) (CBCS) (W.E.F. 2019) Examination July - 2022

> Mathematical & Statistical Foundation of Computer Science (New Course)

Faculty Code : 003 Subject Code : 2032004

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

- 1 (a) Attempt all :
 - (1) Determinants is Scalar Quantity. (True/False)
 - 2) Determinants is not a square. (True/False)
 - (3) In determinants if all the elements of any row Or col. is zero then value of Determinants is zero. (True/False)

(4) The Value of
$$\begin{vmatrix} 3 & 3 \\ 0 & 2 \end{vmatrix} =$$

(b) Any **one** :

(1) If
$$\begin{vmatrix} -2k & 1 \\ 2k & 4 \end{vmatrix} = 12$$
, find k.

(2) The value of
$$\begin{vmatrix} 1 & 6 & 4 \\ 2 & 6 & 4 \\ 0 & -1 & 4 \end{vmatrix}$$

(c) Any one :

(1) If
$$\begin{vmatrix} 5 & 2 & 4 \\ 1 & 2 & y \\ 6 & 3 & y \end{vmatrix} = 0$$
, find y.

(2)
$$\begin{vmatrix} y^2 & 16 \\ 4 & y \end{vmatrix} = 0 \text{ find } y.$$

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(2)

- (d) Any one :
 - (1) Write rules of determinants.
 - (2) Solve by Crammer's : 2x + 9y = 31, 2x + 5y = 19
- 2 (a) Attempt All :
 - (1) Define Zero Matrix
 - (2) Define Row Matrix
 - (3) Define Null Matrix
 - (4) Define Column Matrix
 - (b) Any one :
 - (1) Define Transpose of a Matrix with examples.
 - (2) If $\begin{bmatrix} 5 & -1 \\ 2 & 2 \end{bmatrix}$, find A^2 .

(c) Any one :

(1) If $A = \begin{bmatrix} 4 & 7 \\ 5 & 3 \\ 6 & 2 \end{bmatrix}$ $B = \begin{bmatrix} 9 & -5 \\ 2 & -1 \\ 0 & -3 \end{bmatrix}$ find $(A+B)^T$.

(2) If
$$A = \begin{bmatrix} 2 & 4 \\ 2 & -3 \end{bmatrix}$$
 find $(Adj A)$.

(d) Any one :

- (1) If $A = \begin{bmatrix} 2 & 1 & -1 \\ 1 & 0 & -1 \\ 1 & 1 & 2 \end{bmatrix}$ find A^{-1} .
- (2) If $A = \begin{bmatrix} 4 & 1 \\ 7 & 2 \end{bmatrix}$ and AB = I then find matrix B.

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- 3 (a) Attempt all :
 - (1) Define tabular method of set.
 - (2) Give an example of an infinite set.
 - (3) Write two properties of intersection.
 - (4) Write Distance formula for two points

(b) Any one :

- (1) If $A = \{1, 1\}$ and $B = \{2, 2\}$ $U = \{1, 2, 3, 4, 5\}$ find $(A \cap B)'$
- (2) Two points are (-1, -2) and (-4, 4), find Distance.
- (c) Any one :
 - (1) Find area of triangle whose vertices are (1, 3), (5, 7), (3, 4).
 - (2) If $A = \{2, 4, 5, 6, 8\}$, $B = \{4, 5, 6, 7\}$ and U = $\{x | 0 < x \le 10\}$, find $(A \cup B)'$.
- (d) Any one :
 - (1) For three sets A, B, C prove that $A \cup (B \cup C) = (A \cup B) \cup (A \cup C)$
 - (2) If $A = \{-2, 3, 4, 7\}$, $B = \{3, 4, 5\}$, $C = \{1, 2\}$ find $(A B) \times C$ and $(A \cap B) \times C$.
- 4 (a) Attempt all :
 - (1) Define average.
 - (2) Median is central value. (True / False)
 - (3) Find Mode from : 5, 15, 7, 8, 2, 5, 3, 5, 2, 6, 9, 2, 7, 2
 - (4) If Q1 = 10, Q3 = 50, find Q2

(b) Any one :

- (1) Find Median of the following data : 35, 52, 86, 37, 72, 99, 105
- (2) Find Mean value : 12.28, 16, 20, 17, 21, 30, 44.

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- (c) Any one :
 - (1) Find Mean if Z = 4 and Median = 5.2
 - (2) Find Mean from the following distribution :

<i>x</i> :	10	11	12	13	14	15
f:	5	20	32	28	18	6

- (d) Any one :
 - (1) Find Median from the following distribution.

Class	20-25	25-30	30-35	35-40	40 - 45	45-50	50-55
f	2	5	8	10	7	10	3

(2) Find standard deviation to the following data :

Class	0	1	2	3	4
f	1	3	7	3	1

Attempt all : 5 4 (a) (1)Identify the progression : 64, 16, 4, 1..... (2)In A.P. what is Common (Ratio / Difference) In A.P. if $T_8 = 90$, then what is term number. (3)Find 7th terms of 2, 4, 8, 16,.... (4)2 (b) Any one : In A.P. first term = 5 and d = 2 find 10^{th} term. (1)Find the 10th term of 2, 4, 8, 16, _____ (2)3 (c) Any one : (1)Find the sum of first 20 terms in an A.P. : $(15, 18, 21, \dots, n)$ (2) Two numbers are 4 and 18 find AM, GM, HM. 5 (d) Any one : The 5th term of G.P. is 32 and its 10th term is (1)1024. Find sum of its 12 terms. Find sum of terms of series (2) $7 + 77 + 777 + 7777 + \dots n$ terms.

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