DBZ-003-2032004Seat 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 : ..... 4(1) Determinants is Scalar Quantity. (True/False)(2) Determinants is not a square. (True/False)(3) In determinants if all the elements of any rowOr col. is zero then value of Determinants is zero.(True/False)
(4) The Value of $\left|\begin{array}{ll}3 & 3 \\ 0 & 2\end{array}\right|=$

$\qquad$
(b) Any one : ..... 2
(1) If $\left|\begin{array}{cc}-2 k & 1 \\ 2 k & 4\end{array}\right|=12$, find $k$.(2) The value of $\left|\begin{array}{ccc}1 & 6 & 4 \\ 2 & 6 & 4 \\ 0 & -1 & 4\end{array}\right|$
(c) Any one : ..... 3
(1) If $\left|\begin{array}{lll}5 & 2 & 4 \\ 1 & 2 & y \\ 6 & 3 & y\end{array}\right|=0$, find $y$.
(2) $\left|\begin{array}{cc}y^{2} & 16 \\ 4 & y\end{array}\right|=0$ find $y$.
(d) Any one :
(1) Write rules of determinants.
(2) Solve by Crammer's :

$$
2 x+9 y=31,2 x+5 y=19
$$

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 $\left[\begin{array}{cc}5 & -1 \\ 2 & 2\end{array}\right]$, find $A^{2}$.
(c) Any one :
(1) If $A=\left[\begin{array}{ll}4 & 7 \\ 5 & 3 \\ 6 & 2\end{array}\right] \quad B=\left[\begin{array}{ll}9 & -5 \\ 2 & -1 \\ 0 & -3\end{array}\right]$ find $(A+B)^{T}$.
(2) If $A=\left[\begin{array}{cc}2 & 4 \\ 2 & -3\end{array}\right]$ find $(\operatorname{Adj} A)$.
(d) Any one :
(1) If $A=\left[\begin{array}{ccc}2 & 1 & -1 \\ 1 & 0 & -1 \\ 1 & 1 & 2\end{array}\right]$ find $A^{-1}$.
(2) If $A=\left[\begin{array}{ll}4 & 1 \\ 7 & 2\end{array}\right]$ and $A B=I$ then find matrix $B$.

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 :

2
(1) If $A=\{1,1\}$ and $B=\{2,2\} U=\{1,2,3,4,5\}$ find $(A \cap B)^{\prime}$
(2) Two points are $(-1,-2)$ and $(-4,4)$, find Disiance.
(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 $\mathrm{U}=\{x \mid 0<x \leq 10\}$, find $(A \cup B)^{\prime}$.
(d) Any one :

5
(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 $Q 1=10, Q 3=50$, find $Q 2$
(b) Any one :
(1) Find Median of the following data : $35,52,86,37,72,99,105$
(2) Find Mean value : $12.28,16,20,17,21,30,44$.
(c) Any one :
(1) Find Mean if $Z=4$ and Median $=5.2$
(2) Find Mean from the following distribution :

| $x:$ | 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 |

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

