

**B.Sc.(IT) Semester - 2 (CBCS) Examination****March/April- 2019 (Old Course)****MATHEMATICAL AND STATISTICAL FOUNDATION OF COMPUTER SCIENCE  
(CORE)****Q-1 : (A) Answer the following Questions.****[04]**

- 1). Which Symbol is Used to Define determinant?
- 2). What is the Determinant of  $A = \begin{bmatrix} 2 & 3 \\ 4 & 5 \end{bmatrix}$ ?
- 3). Define: Square Matrix.
- 4). If any two column of a determinants are interchanged the value of new determinant is \_\_\_\_\_.

**Q-1: (B) Attempt any one Question.****[02]**

- 1) Find the determinant of  $A = \begin{bmatrix} 1 & 3 & 2 \\ 2 & 3 & 1 \\ 3 & 2 & 1 \end{bmatrix}$
- 2) Find the determinant of  $B = \begin{bmatrix} 2 & -1 & 1 \\ 3 & -2 & 1 \\ 9 & -5 & 4 \end{bmatrix}$

**Q-1:(C) Attempt any one Question.****[03]**

- 1) Explain determinant of order  $3 \times 3$ .
- 2) Solve the following equation by Cramer's rule  $3x - 2y = 1, 2x + 5y = 3$

**Q-1:(D) Attempt any one Question in detail.****[05]**

- 1) Explain any one Properties of Determinants.
- 2) Solve  $x, y$  &  $z$  using Cramer's rule  $x + y + z = 6, 2x - y + z = 3, 3x + y + z = 8$ .

**Q-2:(A) Answer the following Questions.****[04]**

- 1). Define: Column Matrix.
- 2). Define: Identity Matrix.
- 3). Define: Transpose of Matrix.
- 4). For any Square matrix  $A, A \cdot A^{-1} = \dots\dots\dots$

**Q-2: (B) Attempt any one Question.****[02]**

- 1). If  $A = \begin{bmatrix} 2 & -1 \\ 3 & 2 \end{bmatrix}$  &  $B = \begin{bmatrix} 6 & 7 \\ 5 & 4 \end{bmatrix}$  then find the value of  $3A + 5B$  &  $2A - 4B$ .
- 2). If  $A = \begin{bmatrix} 1 & 2 \\ 4 & 5 \end{bmatrix}$  &  $B = \begin{bmatrix} 3 & 2 \\ 6 & 7 \end{bmatrix}$  then find the value of  $AB$  &  $BA$ .

**Q-2:(C) Attempt any one Question.****[03]**

- 1). If  $A = \begin{bmatrix} 2 & 1 \\ 0 & 4 \end{bmatrix}, B = \begin{bmatrix} 3 & 2 \\ 4 & 1 \end{bmatrix}$  &  $C = \begin{bmatrix} 2 & 4 \\ 1 & 4 \end{bmatrix}$  Verify that  $A \cdot (B + C) = A \cdot B + A \cdot C$
- 2). Find  $A^{-1}$  where  $A = \begin{bmatrix} 2 & -1 & 3 \\ 4 & 2 & 0 \\ -1 & 3 & -2 \end{bmatrix}$

**Q-2:(D) Attempt any one Question in detail.****[05]**

- 1). If  $A = \begin{bmatrix} 1 & 2 & 2 \\ 1 & 2 & 2 \\ 2 & 2 & 1 \end{bmatrix}$  then find  $A^2 - A + I$
- 2). For matrix  $A = \begin{bmatrix} 1 & 4 & 0 \\ -1 & 2 & 2 \\ 0 & 0 & 2 \end{bmatrix}$  Verify that  $(adj A)^{-1} = adj A^{-1}$ .

**Q-3 : (A) Answer the following Questions.****[04]**

- 1). Which Symbol is used to denote Complimentary set?
- 2). What is Parallel line?
- 3). If  $A = \{1, 2, 3\}$  &  $B = \{4, 5, 6\}$  then find  $A \cap B = \dots\dots\dots$
- 4). Write equation for External Division formula.

**Q-3: (B) Attempt any one Question.****[02]**

- 1). If the Distance between the points  $(k, -5)$  &  $(2, k)$  is 13 then find  $k$ .

- 2).  $A=\{2,5,7\}, B=\{5,7\}, C=\{2,5,10\}, D=\{7,8\}$  then verify the result  
 $(A \times B) \cap (C \times D) = (A \cap C) \times (B \cap D)$ .

**Q-3 : (C) Attempt any one Question.**

[03]

- 1). Prove that  $(A \cap B)' = A' \cup B'$ .  
 2). In what Ratio is the segment joining the pair of points  $A(2, -4)$  &  $B(-3, 6)$  is divided by the x-axis, Also find coordinate on x-axis.

**Q-3 : (D) Attempt any one Question in detail.**

[05]

- 1). Show that the points  $(2, -2), (8, 4), (5, 7), (-1, 1)$  are the vertices of a rectangle.  
 2). If  $A = \{5, 6, 7\}, B = \{7, 8, 9\}, C = \{5, 8\}$  then prove  
 that  $A \times (B \cap C) = (A \times B) \cap (A \times C)$  &  $A \times (B - C) = (A \times B) - (A \times C)$ .

**Q-4 : (A) Answer the following Questions.**

[04]

- 1). What is mean?  
 2). Which Symbol used to denote Median.  
 3). Define Range.  
 4). Write an equation Relation between mean, median, & mode.

**Q-4: (B) Attempt any one Question.**

[02]

- 1). Calculate Median for the given frequency

|   |    |    |    |    |    |
|---|----|----|----|----|----|
| X | 10 | 20 | 30 | 40 | 50 |
| f | 3  | 12 | 18 | 12 | 6  |

- 2). Find the range and Coefficient of Range for following data

|   |    |    |    |    |    |    |
|---|----|----|----|----|----|----|
| X | 10 | 20 | 30 | 40 | 50 | 60 |
| f | 12 | 19 | 21 | 25 | 13 | 10 |

**Q-4 : (C) Attempt any one Question.**

[03]

- 1). Explain Advantages and Disadvantages of mean.  
 2). Calculate the quartile deviation and coefficient of quartile deviation for the following data

|   |    |    |    |    |    |    |
|---|----|----|----|----|----|----|
| X | 6  | 14 | 22 | 30 | 38 | 46 |
| f | 30 | 45 | 65 | 30 | 16 | 14 |

**Q-4: (D) Attempt any one Question in detail.**

[05]

- 1). Find mean, median, mode for the following data

|   |   |    |    |    |    |    |
|---|---|----|----|----|----|----|
| X | 5 | 6  | 7  | 8  | 9  | 10 |
| f | 4 | 11 | 16 | 18 | 12 | 5  |

- 2). Calculate Range, Coefficient of range, Quartile deviation, Coefficient of Quartile deviation of following data,

|   |    |    |    |    |    |    |    |
|---|----|----|----|----|----|----|----|
| X | 59 | 62 | 67 | 69 | 73 | 75 | 81 |
|---|----|----|----|----|----|----|----|

**Q-5 : (A) Answer the following Questions.**

[04]

- 1). What is Series?  
 2). Write an equation of  $n^{\text{th}}$  term of an Arithmetic Progression.  
 3). Write an equation of  $n^{\text{th}}$  term of a Geometric Progression.  
 4). For the Series  $2+5+8+\dots$  15<sup>th</sup> term is.....

**Q-5: (B) Attempt any one Question.**

[02]

- 1). The third term of an A.P. is 12 and the sixth term is 42, Find 26<sup>th</sup> term.  
 2). Which term of the G.P.  $2, 2\sqrt{2}, 4, \dots$  is 64?

**Q-5: (C) Attempt any one Question.**

[03]

- 1). The sum of 6 terms of an A.P. is 57 and the sum of its 10 terms is 155 find 20<sup>th</sup> term.  
 2). Find three number in G.P. such that their sum is 130 and their product is 27000.

**Q-5: (D) Attempt any one Question in detail.**

[05]

- 1). Find the sum of the following series  $0.5+0.55+0.555+0.5555+\dots$  upto  $n^{\text{th}}$  term.  
 2). The product of 3 numbers G.P. is 729 and sum of their squares is 819 determine the numbers.

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