



MBI-003-1032004 Seat No. _____

B. C. A. (Sem. II) (CBCS) (WEF - 2016) Examination

March / April - 2018

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

Faculty Code : 003

Subject Code : 1032004

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

[Total Marks : 70

1 (A) Attempt all : 4

(1) How many element in 2×2 determinants ?

(2) Determinants must be _____
(Square / Rectangle)

(3) Symbol of Determinant is _____

(4) The Value of $\begin{vmatrix} 5 & 3 \\ 1 & 2 \end{vmatrix} =$ _____

(B) Any One : 2

(1) $\begin{vmatrix} 5 & -6 \\ 1 & 2 \end{vmatrix} = \begin{vmatrix} k & 4 \\ 3 & 2 \end{vmatrix}$ Find k

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

(C) Any One : 3

(1) Any One $\begin{vmatrix} 1 & 2 & 3 \\ 4 & 5 & x \\ 7 & 8 & 9 \end{vmatrix} = 0$ Find x

(2) $\begin{vmatrix} x & 2 \\ 2 & x \end{vmatrix} = 0$ Find x

- (D) Any One : 5
- (1) Write properties of Determinants
 - (2) Solve by Cramer's : $3x + 7y + 4 = 0, 4x + y - 3 = 0$
- 2 (A) Attempt all : 4
- (1) Define Square Matrix
 - (2) Define Row Matrix
 - (3) Define Column Matrix
 - (4) Define Zero Matrix
- (B) Any One : 2
- (1) Define Symmetric Matrix with examples.
 - (2) If $A = \begin{pmatrix} 6 & -3 \\ 2 & -4 \end{pmatrix} B = \begin{pmatrix} 4 & 3 \\ 2 & -3 \end{pmatrix}$ Find $(A + B)$
- (C) Any One : 3
- (1) If $A = \begin{pmatrix} 4 & 7 \\ -2 & 3 \\ 6 & 2 \end{pmatrix} B = \begin{pmatrix} 9 & 5 \\ 2 & -1 \\ 0 & 3 \end{pmatrix}$ Find $A^T + B^T$
 - (2) If $x = \begin{pmatrix} 6 & -4 \\ -2 & 3 \end{pmatrix}$, Find $(Adj x)$
- (D) Any One : 5
- (1) $A = \begin{pmatrix} 2 & -3 & 5 \\ 5 & 2 & -7 \\ -4 & 3 & 1 \end{pmatrix}$ Find A^{-1}
 - (2) If $A = \begin{pmatrix} 6 & 4 \\ -2 & 3 \end{pmatrix}$ and $B = \begin{pmatrix} 9 & 2 \\ -4 & -3 \end{pmatrix}$ Prove that
 $(AB)^T = B^T A^T$
- 3 (A) Attempt all : 4
- (1) Define Complimentary Set
 - (2) Define Union of Two Sets
 - (3) Write Demorgan's Law
 - (4) Write Distance formula for two points

- (B) Any One : 2
- (1) If $A = \{x, y\}$ and $B = \{-1, -2\}$ Find $A \times B$
- (2) Two points are $(4, -2)$ and $(6, -3)$ Find Distance
- (C) Any One : 3
- (1) Find Area of triangle for the following points $(2, 1), (-3, 1), (0, -3)$
- (2) If $A = \{2, 4, 5, 6, 8\}, B = \{0, 1, 3, 4, 5, 6, 7\}$ and $U = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$, Find $(A \cap B)'$
- (D) Any One : 5
- (1) For Three sets A, B, C, prove that $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$
- (2) $A = \{11, 12, 13\}, B = \{10, 12\}$ and $C = \{12, 13\}$, verify that $A \times (B \cap C) = (A \times B) \cap (A \times C)$
- 4 (A) Attempt all : 4
- (1) Define Mean
- (2) Define Median
- (3) Define Range
- (4) Define third quartile
- (B) Any One : 2
- (1) Find Mean of the following data : 8, -5, 10, 21, 36
- (2) Find Mode value : 2, 3, 4, 11, 2, 7, 3, 2, 5, 9, 3, 5, 3, 8
- (C) Any One : 3
- (1) Find Median M if $Z = 4$ and Mean = 5
- (2) Find Mean from the following Distribution
- | | | | | | | |
|-------|----|----|----|----|----|---|
| $x :$ | 0 | 1 | 2 | 3 | 4 | 5 |
| $f :$ | 10 | 12 | 15 | 12 | 10 | 8 |
- (D) Any One : 5
- (1) Find Median from the following Distribution
- | | | | | | | | |
|--------------------------|----|----|----|----|---|---|---|
| <i>No. of Mistakes :</i> | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| <i>No. of Students :</i> | 11 | 28 | 50 | 12 | 8 | 5 | 5 |
- (2) The runs scored by Rahul in six innings are 60, 45, 25, 40, 60, and 32, find SD

- 5 (A) Attempt all : 4
- (1) Define Arithmetic Progress
 - (2) Define Geometric Progress
 - (3) Find required terms from $7, 8\frac{1}{2}, 10, 11\frac{1}{2}$
 _____ (81th Term)
 - (4) Find required terms from $1, \sqrt{2}, 2, 2\sqrt{2},$ _____
 (15th Terms)
- (B) Any One : 2
- (1) Find sum of 100, 90, 80, 70 up to 18 Terms
 - (2) Find Sum of 1, 2, 4, 8 _____ up to 12 Terms
- (C) Any One : 3
- (1) The 4th term of an AP is 19 and its 12th term is 51, find its 21st term
 - (2) Find AM,GM,HM of two numbers 2 and 72
- (D) Any One : 3
- (1) Find the sum of 2n terms of the series
 $1 - 2 + 3 - 6 + 5 - 10 + 7 - 14 +$ _____
 - (2) Find sum of terms of series
 $0.2 + 0.22 + 0.222 + 0.2222 +$ _____