NBI-003-1042004 Seat No. _____

B. Sc. (I.T.) (Sem. II) (CBCS) Examination

April/May - 2017

Mathematical & Statistical Foundation of Comp. Science

(New Course)

Faculty Code : 003

Subject Code : 1042004

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

1 (a) Attempt all : **4**

(1) Determinant must be square. (true/false)

(2) The value of $\begin{vmatrix} 4 & -1 \\ 3 & 7 \end{vmatrix}$ is 25. (true/false)

(3) In 3×3 order determinant, number of elements are ____.

(4) The value of $\begin{vmatrix} 2 & 1 \\ 1 & 2 \end{vmatrix}$ is _____.

(b) Any one : **2**

(1) If $\begin{vmatrix} 4 & 6 \\ 9 & -2 \end{vmatrix} = \begin{vmatrix} x & 5 \\ 3 & 2 \end{vmatrix}$ find x.

(2) Solve $\begin{vmatrix} 4 & 6 & -2 \\ 3 & 0 & 2 \\ 3 & 0 & 2 \end{vmatrix}$.

(c) Any one : **3**

(1) If $\begin{vmatrix} k & 2 & -2 \\ 5 & 6 & 9 \\ 3 & 4 & -2 \end{vmatrix} = 10$ find k.

(2) Solve $\begin{vmatrix} y & 3 \\ 3 & y \end{vmatrix} = 0$.

(d) Any one : **5**

(1) Solve by Cramer's rule :

$4x + 3y + 3 = 0,\ 2x - 7 = -2$.

(2) Write any two properties of determinant with example.

2 (a) Attempt all : **4**

(1) Define Symmetric matrix.

(2) Define Identity matrix.

(3) Define Square matrix.

(4) Define Row matrix.

(b) Any one : **2**

(1) If $A = \begin{bmatrix} 4 & -5 \\ -3 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 6 & -3 \\ -2 & 5 \end{bmatrix}$ find $A - B$.

(2) If $A = \begin{bmatrix} 3 & 5 \\ 6 & 2 \end{bmatrix}$ find A^2.

(c) Any one : **3**

(1) $A = \begin{bmatrix} 6 & 3 & -2 \\ 4 & -1 & 2 \\ 4 & 3 & 3 \end{bmatrix}$, $B = \begin{bmatrix} 5 & 3 & 5 \\ 6 & 3 & 2 \\ 4 & -1 & 2 \end{bmatrix}$ find $(A+B)^t$.

(2) $A^{-1} = \begin{bmatrix} 4 & 3 \\ 2 & 4 \end{bmatrix}$ $B^{-1} = \begin{bmatrix} 6 & -1 \\ 3 & 0 \end{bmatrix}$ obtain $(AB)^{-1}$.

(d) Any one : **5**

(1) $A=\begin{bmatrix}6 & 4\\ 9 & 3\end{bmatrix}$, $B=\begin{bmatrix}3 & 4\\ 3 & 2\end{bmatrix}$ verify that

$(A+B)^2=A^2+B^2$.

(2) $A=\begin{bmatrix}1 & 1 & 1\\ 2 & -1 & -1\\ 1 & -1 & 1\end{bmatrix}$ find A^{-1}.

3 (a) Attempt all : **4**

(1) Define Set

(2) Define Intersection of two sets

(3) Write Demorgan's law.

(4) Write distance formula for two points

(b) Any one : **2**

(1) If $A=\{0,1\}$ $B=\{a,b\}$ find $A\times B$.

(2) Find distance from two points (6, 2) and (3, –3).

(c) Any one : **3**

(1) Find Area of triangles

$A(2,1)$, $B(-3,1)$, $C(0,-3)$.

(2) If $U=\{1,2,3,4,5,6,7,8,9,10\}$ $A=\{5,9,7,2\}$

$B=\{3,4,5,7\}$, find $(A\cup B)'$.

(d) Any one : **5**

(1) Prove that $(A\cup B)'=A'\cap B'$.

(2) If $A=\{-1,0,1\}$, $B=\{0,1,2,3,5\}$,

$C=\{-2,0,1,2,4,5,6\}$ verify that

$A\cup(B\cap C)=(A\cup B)\cap(A\cup C)$.

4 (a) Attempt all : **4**

(1) Define Third Quartile (2) Define Range

(3) Define Mean (4) Define Mode

(b) Any one : **2**

(1) Find median of the following series :
10, 12, 8, 14, 9, 20, 18, 5, 13.

(2) Find mean : 28, 27, 34, 50, –20, 21.

(c) Any one : **3**

(1) Find Median from the following distribution :

x :	0	2	4	6	8
f :	5	10	12	8	6

(2) Find Q_1 and Q_3 :
29, 12, 26, 19, 24, 36, 21, 33, 35.

(d) Any one : **5**

(1) The Mean of following distribution is 18.1.
Find missing frequency :

Class :	5–10	10–15	15–20	20–25	25–30	30–35
Fre. :	11	20	35	20	?	6

(2) Find standard deviation for the following observation
73, 82, 75, 68, 70, 90, 80, 71.

5 (a) Attempt all : **4**

(1) Define AM, GM for two numbers's.

(2) Define Arithmetic progress.

(3) Define Geometric progress.

(4) Find 10^{th} term of : 8, 11, 14, ...

(b) Any one : **2**

(1) Find sum of 1024, –512, 256, ...(Upto 9 terms)

(2) Find sum of 100, 200, 300, 400, ...(Upto 20 terms)

(c) Any one : **3**

(1) Find AM, GM, HM of 16, 9.

(2) The 10^{th} term of AP's is 11, and 11^{th} term is 10. Find sum of 40 terms.

(d) Any one : **5**

(1) Find sum of
7+77+777+.....+ n terms

(2) Find sum of 2n terms of
1–2+3–6+5–10+7.....