DV-003-003208   Seat No. _____

B. C. A. (Sem. II) (CBCS) Examination

April / May – 2015

Maths / Stat. Foundation of Comp. Sci.

(New Course)

Faculty Code : 003

Subject Code : 003208

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

1   M.C.Q's :   **20**

(1) $A \cap A' = \ldots\ldots$

    (A) ϕ (B) A

    (C) $\{\phi\}$ (D) None of these

(2)   If $A = \{1, 2, 3, 4, 6, 9, 10\}$, $B = \{2, 6, 10\}$ then $A - B = \ldots\ldots$

    (A) $\{1, 3, 4, 9\}$ (B) $\{1, 2, 4, 9\}$

    (C) $\{2, 6, 10\}$ (D) None of these

(3)   If $A \subseteq B$ and $B \subseteq A$ then $A - B$.

    (A) C (B) $=$

    (C) $\neq$ (D) None of these

(4)   How many are subsets of a set $\{1, 2, 3\}$?

    (A) 4   (B) 8

    (C) 3   (D) 6

(5)   If $A = \{a, b, c\}$, $C = \{1, 2, 3, 4\}$, how many elements are in $A \times C$?

    (A) 7   (B) 24

    (C) 12   (D) 20

(6) The slope of the line passing through the points (2, 2) and (4, 6) is _____

(A) 4   (B) 3

(C) 2   (D) None of these

(7) For two parallel lines which of the following condition is true ?

(A) $m_1 \times m_2 = -1$ (B) $m_1 \neq m_2$

(C) $m_1 \times m_2 \neq -1$ (D) $m_1 = m_2$

(8) The equation of line passing through origin having slope 3 is _____

(A) $y = 3x + 8$ (B) $y = 8x + 3$

(C) $3x + 3y = 1$ (D) None of these

(9) $\sqrt{3}, \sqrt{15}, \sqrt{75}, \sqrt{375}$ .... are in _____

(A) GP   (B) AP

(C) HP   (D) None of these

(10) For an A.P. $S_n = n(n+1)$. Find T_n.

(A) n^2 (B) $2n$

(C) $3n$ (D) $5n$

(11) Which term of the sequence $-1, -3, -5, ...$ is -39 ?

(A) 19   (B) 20

(C) 21   (D) 24

(12) State the formula of an A.P.

(A) $Tn = a - (n-1)d$ (B) $Tn = a(n+1)d$

(C) $Tn = (n+1)d$ (D) None of these

(13) If $A = \begin{bmatrix} 2 & 3 \\ 4 & 5 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 3 \\ 2 & -1 \end{bmatrix}$ then $A + B = ...$

(A) $\begin{bmatrix} 3 & 6 \\ 6 & 4 \end{bmatrix}$

(B) $\begin{bmatrix} 3 & 6 \\ 6 & -4 \end{bmatrix}$

(C) $\begin{bmatrix} 1 & 0 \\ 2 & -6 \end{bmatrix}$

(D) None of these

(14) Unit matrix is denoted by

(A) U

(B) I

(C) O

(D) None of these

(15) If $A = \begin{bmatrix} x & y \\ a & b \end{bmatrix}$ then $2A = ...$

(A) $\begin{bmatrix} x & y \\ 2a & 2b \end{bmatrix}$

(B) $\begin{bmatrix} 2x & 2y \\ a & b \end{bmatrix}$

(C) $\begin{bmatrix} 2x & 2y \\ 2a & 2b \end{bmatrix}$

(D) None of these

(16) If $A = \begin{bmatrix} 1 \\ 4 \\ 6 \end{bmatrix}$ then A'.

(A) $\begin{bmatrix} 11 \end{bmatrix}$

(B) $\begin{bmatrix} 1 \\ 4 \\ 6 \end{bmatrix}$

(C) $\begin{bmatrix} 14 \end{bmatrix}$

(D) None of these

(17) The square value of S.D. is called _____

(A) variance

(B) mean

(C) median

(D) none of these

(18) A S.D. can be denoted as _____

(A) Σ (B) σ

(C) Δ (D) None of these

(19) The mean of the observations 5, 7, 9, 11, 13 is _____

(A) 45   (B) 5

(C) 9   (D) None of these

(20) The median of 15, 25, 5, 3, 40 is _____

(A) 5   (B) 25

(C) 4   (D) None of these

2 (a) Any **three** :   6

(1) Explain : Power set

(2) Write properties of union of sets.

(3) If the distance between $(b, -5)$ and $(2, b)$ is 13. Find the value of b.

(4) Find the co-ordinates of a point which divides the line joining the pts. (1, -2) and (4, 7) in the ratio 2 : 3.

(5) Find Median

4, 24, 15, 35, 55, 45

(6) Explain : Range.

(b) Any three :   9

(1) If $U = \{x \mid x \in N, x \leq 11\}$, $A = \{1, 3, 7, 10, 11\}$,

$B = \{2, 3, 4, 6, 9, 10\}$ then verify that

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

(2) If $A = \{1, 0\}$, then find A^2.

(3) Find the equation of the st. line parallel to $2x - 3y - 5 = 0$ and passing through $(4, 5)$.

(4) The co-ordiante of two points A and B are $(-1, 2)$ and $(2, -1)$. Find the equation.

(5) Explain : Merits of Mean.

(6) Obtain the value of Q_1.

$x:$	2	3	4	5	6	7	8	9	10	11
$y:$	3	6	9	18	20	14	10	10	7	2

(c) Any two :   10

(1) If $A = \left\{ x \middle| x^2 - 5x + 6 = 0, \ x \in N \right\}$, $B = \left\{ y \middle| y^2 - 4 = 0, \ y \in z \right\}$,

$C = \left\{ z \middle| z^2 - 9z + 14 = 0, z \in N \right\}$, Find $(A \times B) \cup (A \times C)$.

(2) Obtain equation of line passing through at Pt. (x_1, y_1) having slope m.

(3) Obtain the value of S.D..

$Class:$	60 – 64	65 – 69	70 – 74	75 – 79	80 – 84	85 – 89	90 – 94
$Freq.$	5	7	10	8	5	3	2

(4) Obtain the value of Mode

$Class:$	200 – 299	300 – 399	400 – 499	500 – 599	600 – 699	700 – 799	800 – 899
$Freq.$	3	61	118	139	126	51	2

(5) Find mean :

$Class:$	10 – 18	18 – 30	30 – 40	40 – 54	54 – 80	80 – 110
$Freq.$	15	28	36	18	10	8

3 (a) Any three : **6**

(1) Define : G.P.

(2) Obtain the sum up to n terms : $2+4+6+8+\ldots\ldots$

(3) The 6$^{\text{th}}$ term of cm. A.P. is 121. Find the sum of its first 11 terms.

(4) Explain : Adjoint matrix.

(5) If $A = \begin{bmatrix} 2 & 5 \\ 1 & 3 \end{bmatrix}$. Find A^2

(6) If $A = \begin{bmatrix} 2 & 5 \\ 3 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & 2 \\ 1 & 1 \end{bmatrix}$ then prove that $(A+B)' = A'+B'$.

(b) Any three : **9**

(1) $T_5 = 32$, $T_{10} = 1024$ are in G.P. find T_8.

(2) Prove that $S_n = \dfrac{a\left(r^n - 1\right)}{r-1}$.

(3) Find the sum of n terms
$0.3 + 0.33 + 0.333 + \ldots\ldots$

(4) If $x = \begin{bmatrix} 1 & 2 & 3 \\ 0 & 3 & 1 \\ 0 & 0 & 1 \end{bmatrix}$, $y = \begin{bmatrix} 1 & 0 & 0 \\ 2 & 2 & 0 \\ 1 & 1 & 3 \end{bmatrix}$ then find $x(x+y)$.

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

(6) If $A = \begin{bmatrix} 2 & 1 & 3 \end{bmatrix}$, $B = \begin{bmatrix} 3 & 1 & 0 \\ 2 & 0 & 5 \\ 5 & 2 & 0 \end{bmatrix}$ and $C' = \begin{bmatrix} 3 & 2 & 5 \end{bmatrix}$,

find ABC.

(c)   Any two :   **10**

(1)   Prove that $S_n = \dfrac{n}{2}\big(2a + (n-1)d\big)$.

(2)   The sum of three consecutive terms is 26 and its product is 216. Find the terms.

(3)   If $A = \begin{bmatrix} 1 & -1 \\ -1 & 1 \end{bmatrix}$ prove that $A^3 = 4A$.

(4)   If $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ then prove that $A^2 - 4A - 5I_3 = O_3$.

(5)   If $3A - B = \begin{bmatrix} 17 & 19 \\ 12 & 8 \end{bmatrix}$ and $2A - B = \begin{bmatrix} 8 & 11 \\ 8 & 7 \end{bmatrix}$

find $4A - 3B$.

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