



DV-003-003204

Seat No. _____

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

April / May - 2015

Mathematical & Statistical Found. of Comp. Science

Faculty Code : 003

Subject Code : 003204

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

[Total Marks : 70

1 M.C.Q. :

20

(1) $\{10, 20, 30\} \cap \{10, 30, 40\} = \dots\dots\dots$

(A) $\{10\}$

(B) $\{10, 30\}$

(C) $\{20, 40\}$

(D) $\{10, 20\}$

(2) Null set is denoted by _____

(A) ϕ

(B) $\{ \}$

(C) both (A) and (B)

(D) None

(3) $U = \{1, 2, 3, 4, 5\}$, $A = \{4, 5\}$ $A' =$ _____

(A) $\{1, 2, 3\}$

(B) $\{1, 2\}$

(C) $\{3, 4, 5\}$

(D) $\{1, 2, 3, 4, 5\}$

(4) $A \cup A' =$ _____

(A) ϕ

(B) U

(C) A

(D) None

- (5) A set which contain only one element is called _____
- (A) Singleton set (B) Null set
(C) Subset (D) None
- (6) $A \cap U =$ _____
- (A) ϕ (B) A
(C) U (D) None
- (7) Two perpendicular lines which of the following condition is true ?
- (A) $m_1 = m_2$ (B) $m_1 \neq m_2$
(C) $m_1 m_2 = -1$ (D) None
- (8) The equation of line having slope 3 and y -intercept 7 is _____
- (A) $y = 3x + 7$ (B) $7y = x + 3$
(C) $y = 7x + 3$ (D) None
- (9) Two lines are parallel. If slope of one line is 5 then slope of other line is _____.
- (A) -5 (B) 5
(C) $\frac{1}{5}$ (D) None
- (10) The common ratio of 2, 4, 8, 16, is _____
- (A) 2 (B) $\frac{1}{2}$
(C) 4 (D) None

- (11) GM of 2 and 32 is _____
- (A) 17 (B) 8
(C) 4 (D) None
- (12) If A, H and G are respectively AM, HM, GM of two positive numbers then $AH =$ _____
- (A) G (B) GH
(C) HG (D) G^2
- (13) The value of r is between _____ to _____
- (A) 0, 1 (B) -1, 0
(C) -1, 2 (D) None
- (14) $b_{xy} \cdot b_{yx} =$ _____
- (A) r (B) \sqrt{r}
(C) $\frac{1}{r}$ (D) None
- (15) In exponential smoothing method $\alpha = 0.7$, then $1 - \alpha =$ _____
- (A) 0.7 (B) 1
(C) 0.3 (D) None
- (16) $y = 4 + 3(x - 1997)$. If $x = 1999$ then $y =$ _____
- (A) 2 (B) 6
(C) 10 (D) None
- (17) _____ distribution is used for C-chart.
- (A) Binomial (B) Normal
(C) Poisson (D) None

- (18) SQC is _____
- (A) Value control (B) Good control
(C) Process control (D) Product control
- (19) $\bar{C} = 16$ then UCL for $\bar{C} =$ _____
- (A) 4 (B) 16
(C) 28 (D) None
- (20) $\Sigma p = 0.20$, $m = 10$, $n = 100$ then $\bar{p} =$ _____
- (A) 2.2 (B) 0.22
(C) 0.02 (D) None

2 (a) Any three :

6

- (1) Define :
- (a) Power set
(b) Subset.
- (2) Write distributive laws for set.
- (3) Write equation of line passing through two points
 (x_1, y_1) and (x_2, y_2) .
- (4) $A = \{x, y\}$ write power set of A .
- (5) Find equation of line passing through $(-1, 3)$ and
slope $2/3$.
- (6) Find Area for $(2, 5)$, $(1, 5)$, $(2, 4)$.

(b) Any **three** :

9

- (1) Define complement of set, also write its properties.
- (2) $A = \{11, 12\}$, $B = \{12, 13, 14\}$, $C = \{12, 15\}$ verify
 $A \times (B \cap C) = (A \times B) \cap (A \times C)$.
- (3) Find ratio of line joining $A(1, -3)$, $B(3, 5)$ is divided by $C(6, 17)$.
- (4) The line joining $(k, 3)$ and $(1, 2)$ is perpendicular to the line joining $(-3, 2)$ $(1, 0)$ find k .
- (5) Find straight line to the following data :

Year	2001	2002	2003	2004	2005	2006	2007
y	90	98	100	92	104	108	101

(6)
$$\begin{matrix} A & B \\ \begin{bmatrix} 0.2 & 0.2 \\ 0.4 & 0.1 \end{bmatrix} \end{matrix}$$

If final demand are 100 and 20 respectively, find total production of A and B .

(c) Any **two** :

10

- (1) Prove that $(A \cup B)' = A' \cap B'$
- (2) Obtain equation of line passing through origin and having slope m .
- (3) Fit second degree parabola :

Year	1991	1992	1993	1994	1995
Profit	7	9	10	13	18

- (4) Using exponential smoothing method, $S_0 = 400$, $\alpha = 0.25$ prepare forecast table :

Year	2001	2002	2003	2004	2005
Value	445	438	464	536	567

- (5) Prove that $(2, -2)$ $(14, 10)$ $(11, 13)$, $(-1, 1)$ are the vertices of rectangle.

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

- (1) Define :
- (a) Correlation
 - (b) Regression.
- (2) Define Arithmetic Progress.
- (3) Write properties of correlation coefficient.
- (4) Write properties of Regression coefficient.
- (5) Find S_{20} for 15, 18, 21,
- (6) $\Sigma np = 150$, $m = 15$, $n = 100$, find CL and LCL for np -chart.

(b) Any three : **9**

- (1) Difference between Correlation and Regression.
- (2) For two numbers x, y prove that $A \geq G \geq H$.
- (3) Explain SQC.
- (4) Write control limits for P-chart.
- (5) For an AP, $T_8 = 15$ and $T_{25} = 49$, find first three terms.
- (6) Which term will be $\frac{1}{1536}$ in G.P.

$$\frac{1}{3}, \frac{1}{6}, \frac{1}{12}, \dots$$

(c) Any two :

10

(1) Three numbers are in GP. Their sum and product are 28 and 512, find numbers.

(2) Find r :

x :	1	2	3	5	6	8	10
y :	3	1	2	0	-1	2	4

(3) Find b_{xy} , b_{yx} :

x :	10	11	12	5	6	8	2	3
y :	12	13	15	7	9	10	4	6

(4) $\Sigma\bar{x} = 210$, $\Sigma R = 45$, $m = 10$ ($A_2 = 0.577$), find control limits for \bar{X} chart.

(5) Find control limits for following data :

Sample No. :	1	2	3	4	5	6	7	8
Sample size :	10	10	10	10	10	10	10	10
No. of defective :	2	3	0	1	2	4	2	1

—————