



AL-21156

Seat No. _____

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

March / April – 2016

CS-10 : Math. & Statistical Foundation of Comp. Sci.

Time : 3 Hours]

[Total Marks : 100

1 Attempt any four. 20

- (1) Define Union of sets and properties of union of sets.
- (2) Let A , B and C be any 3 sets. Prove that $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$.
- (3) If $U = \{x \in N / 1 \leq x \leq 8, \}$, $A = \{1, 2, 3\}$ and $B = \{2, 3, 4\}$, then verify the De Morgan's two rules.
- (4) If $A = \{1, 2, 3\}$ and $B = \{2, 3, 4\}$ then find $A \Delta B$.
- (5) Draw an appropriate control chart for the following data.

Sample No.	1	2	3	4	5	6	7	8	9	10
No. of Items	140	149	153	151	149	151	110	120	153	150
No. of Defective Items	6	8	9	1	9	3	0	5	6	3

2 Attempt any four. 20

- (1) Differentiate chart for variable and chart for attributes.
- (2) What is correlation? Explain types of correlation.
- (3) Calculate coefficient of correlation from the following data.

X	12	9	8	10	11	13	7
Y	14	8	6	9	11	12	3

- (4) Calculate regression equation of Y on X . Estimate the likely demand when price is Rs. 20.

Price (X)	10	12	13	12	16	15
Amount Demanded (Y)	40	38	43	45	37	43

- (5) Given the two regression lines $12x - 85y + 99 = 0$ and $60x + 27y = 321$ and $S_x^2 = 36$. Calculate \bar{x}, \bar{y}, r and S_y .

3 Attempt any four.

20

- (1) Draw mean and range chart from the following data.

Sample No.	1	2	3	4	5	6	7	8	9	10
Mean	603	569	629	680	641	651	586	711	665	689
Range	251	309	188	176	200	490	171	134	167	219

$$A_2 = 0.48, D_3 = 0, D_4 = 2 \text{ and } n = 6.$$

- (2) For what value of K , the distance between two points $(K, -4)$ and $(-8, 2)$ will be 10 units.
- (3) Prove that $(3, 2), (5, 4), (3, 6), (1, 4)$ are the vertices of a square.
- (4) Find the co-ordinates of two points which divide the points $(6, -5)$ and $(-7, -15)$ internally in the ratio of 4:7.
- (5) Find the intercepts of X and Y axes of the line $3X - 4Y + 10 = 0$.

4 Attempt any four :

20

- (1) Write note on input - output analysis.
- (2) Fit a straight line for the following series.

Year	1996	1997	1998	1999	2000	2001	2002
Production	125	128	133	135	140	141	143

- (3) Fit an exponential curve $y = a \cdot e^{bx}$:

Year	1980	1981	1982	1983	1984	1985	1986
Sales	32	47	65	92	132	190	275

- (4) Find the trend for the following data using 3-yearly weighted moving average taking weight 1, 2, 1 respectively.

Year	1995	1996	1997	1998	1999	2000	2001
Values	2	4	5	7	8	10	13

- (5) The following table gives the input-output coefficient for a two sector economy consisting of agriculture (A) and Manufacturing (M) industry

$$\text{OUTPUT} \begin{matrix} \text{INPUT} \\ \text{A} \quad \text{M} \\ \begin{pmatrix} 0.10 & 0.50 \\ 0.20 & 0.25 \end{pmatrix} \end{matrix}$$

The final demands for the two industries are 300 and 100 units respectively. Find the gross output of the two industries.

5 Attempt any four :

20

- (1) The 6th term of an AP is 47 and 10th term is 75. Find 30th term.
- (2) If $d = 4$, $l = 40$, $n = 12$ then find a and S_n .
- (3) The 4th term of GP is 4 and the product of 2nd and 4th terms is 1. Find the 6th term and sum of first 6 terms.
- (4) Find the sum up to n terms of
 $0.7 + 0.77 + 0.777 + 0.7777 + \dots$
- (5) The product of 4 numbers in GP is 1024 and the product of 1st and 3rd numbers is 16. Find the numbers.
