



ML-184-003-003204 Seat No. _____

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

April/May - 2012

Math and Stat Foundation of Computer Sci.

Faculty Code : 003

Subject Code : 003204

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

[Total Marks : 70

1 M.C.Q :

20

(1) When proving that given vertices are the vertices of an equilateral triangle, it is necessary to show _____.

- (A) All of its sides are equal
- (B) Two of its sides are equal
- (C) All of its sides are different
- (D) None

(2) If three points are collinear points then which of the following condition is true ?

- (A) The area of triangle = 0
- (B) The area of triangle = 1
- (C) The area of triangle is infinite
- (D) None

(3) The equation of the line passing through origin and having slope 99 is _____.

- (A) $x+y+99 = 0$
- (B) $y = 99x$
- (C) $x-y+99 = 0$
- (D) $99x+99y+1=0$

(4) The slope of line passing through the points (1,2) and (3,6) is _____.

- (A) 1
- (B) 2
- (C) 3
- (D) 4

- (5) $(A)' =$ _____.
- ~~(A)~~ A (B) U
(C) ϕ (D) B
- (6) Empty set is also known of _____.
- ~~(A)~~ Null set (B) Infinite set
(C) Equal set (D) Singleton set
- (7) Which of the following set is finite ?
- ~~(A)~~ $\{x/x \text{ is odd no, } x \in N\}$ (B) $\{x/x < 5, x \in N\}$
(C) $\{x/x < 10, x \in Z\}$ (D) N
- (8) $A = \{x, y, z\}$ $B = \{x, v, w\}$, $A \cap B =$ _____.
- (A) ϕ (B) A
~~(C)~~ $\{x\}$ (D) None
- (9) In exponential. Smoothing method if $\alpha = 0.2$ then β _____.
- (A) 0.2 (B) 0.8
(C) 1.2 (D) 1
- (10) The stright line. $y = 7 + 2(x - 2006)$ then forecast for year 2010 is _____.
- (A) 14 (B) 15.5
(C) 15 (D) 16
- (11) For two positive number A - G - H
- (A) \geq (B) \leq
(C) $=$ (D) None
- (12) Find a GM of two numbers 8, 2
- (A) 16 (B) 2
(C) 32 (D) 4

- (13) The fourth term of a sequence 2, 6, 18 _____
 (A) 14 (B) 36
 (C) 72 ~~(D) 54~~
- (14) If $a=1, l=9$, then $S_{12} =$ _____.
 (A) 120 ~~(B) 60~~
 (C) 54 (D) 50
- (15) Which of the following value could not represent a correlation co-efficient.
 (A) 0.12 (B) -1
 (C) 2.6 (D) 0.25
- (16) If $\sum(x-\bar{x})^2 = 9,000$ and $n=10$ then $S_x =$ _____.
 (A) 30 (B) 9
 (C) 1 (D) None
- (17) If a value of correlation coefficient is 1 then it is said to be _____.
 (A) Perfect negative (B) Partial negative
 (C) Perfect positive (D) Partial positive
- (18) Which distribution is used in C - chart ?
 (A) Binomial (B) Normal
 (C) Poisson (D) None
- (19) For R-chart, $\bar{R}=6.5, D_3=0, D_4=2.115$; then UCL = _____.
 (A) 6.5 (B) 0
 (C) 13 (D) 13.7475
- (20) Which charts are most sensitive ?
 (A) P and C (B) p and np
 (C) np and c (D) \bar{x} and R

1 (a) Any three :

6

- (1) Define with example.
 - Equivalent set
 - Complement of a set
- (2) Describe methods of representation of a set.
- (3) $A=\{a,b\}$, $B=\{2,3\}$, $C=\{3,4\}$ find $A \times (B \cap C)$
- (4) Find the equation of a line having slope $1/2$ and passing through $(-2,7)$
- (5) Define - Parallel line,
 - Perpendicular line
- (6) Prove that the line passing through the points $(-3,5)$ and $(6,-7)$ is parallel to the line passing through the points $(-2,-9)$ and $(-8,-1)$.

(b) Any three :

9

- (1) Fit a straight line to the following data :

<i>Year</i> :	2001	2002	2003	2004	2005
<i>Sales</i> :	40	50	62	58	60
- (2) Find trend by 3 - yearly moving averages method :

<i>Years</i> :	1991	1992	1993	1994	1995	1996	1997
<i>Value</i> :	112	104	108	121	116	111	133
- (3) Find ratio in which the point $(3,10)$ divides the line joining the points $(5,12)$ and $(2,9)$
- (4) $U = \{a, b, c, 1, 2, 3\}$ $A = \{a, b, c\}$
 $B = \{1, 2, 3\}$ $C = \{a, 1, 2\}$
 $D = \{a, b, 3\}$

Find (1) $(C \cap D)'$ (2) $(A - B) \cap (B - A)$

(5) $U = \{x \in N / 1 \leq x \leq 6\}$

$A = \{2, 3, 6\} B = \{3, 5, 6\}$

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

(6) Prove that (3,2) (5,4) (3,6) (1,4) are the vertices of a square.

(c) Any two : 10

- (1) Write associative law of union and prove it.
- (2) Obtain the equation of line making intercept on x-axis and y-axis.
- (3) Find the equation of a line passing through (4,2) and parellel to $3x-2y=5$.
- (4) The following is a technology matrix.

$$\begin{matrix} & A & B \\ A & \begin{bmatrix} 0.1 & 0.3 \end{bmatrix} \\ B & \begin{bmatrix} 0.6 & 0.2 \end{bmatrix} \end{matrix}$$

If the final demand are 30 and 100 respectively, find total product of A and B.

(5) By taking $S_0 = 100, d = 0.3$ prepare forecasts by method of expomential smoothing.

Year:	1985	1986	1987	1988	1989
Value:	188	199	212	227	231

2 (a) Any three : 6

- (1) Write properties of correlation co efficient.
- (2) Define with example.

- Arithmetic progression

(3) if A, H, G are respectively A. M., H. M., G. M. of two positive number a and b, prove that $G^2 = AH$

(4) Write uses of S.Q.C.

(5) Find 9th term of 2, 6, 18, 54....

(6) $\bar{x} = 39.5, \bar{y} = 47.5, S_x = 10.8, S_y = 16.8, r = 0.42$, Find b_{yx} and b_{xy} .

(b) Any three :

9

(1) Write difference between np and p - chart.

(2) Short note : C - chart.

(3) Obtain control limits of \bar{x} - chart $n=4, m=30$,
 $\sum \bar{x} = 59.82, \sum R = 17.22, A_2 = 0.729$.

(4) Find correlation coefficient.

x: 3 4 6 7 10

y: 9 11 14 15 16

(5) Find sum of first 40 natural numbers.

(6) The sum of AM and GM of two numbers a and b is 45, and $b=4a$ find the numbers.

(c) Any two :

10

(1) Five numbers are in A.P. their sum is 35 and product of first and fifth number is 33 find the numbers.

(2) Draw a C - chart from the followings :

defect : 4, 6, 8, 2, 4, 3, 2, 5, 6, 1, 3, 1, 2, 5, 2

(3) Find control limits of \bar{x} and R - chart.

$$n = 5, A_2 = 0.577, D_3 = 0, D_4 = 2.115$$

Sample no:	1	2	3	4	5	6	7	8	9
\bar{X} :	52	50	50	51	47	52	49	54	51
R:	6	7	6	5	6	9	8	7	7

(4) Find regression equation y on x.

$$x: 1 \ 5 \ 3 \ 2 \ 1 \ 2 \ 7 \ 3$$

$$y: 6 \ 1 \ 0 \ 0 \ 1 \ 2 \ 1 \ 5$$

(5) Explain scatter diagram method.