

Seat No. : \_\_\_\_\_

**N29-101**

**December-2014**

**B.B.A., Sem.-III**

**CC-206 : Statistics  
(Elementary Statistics)**

**Time : 3 Hours]**

**[Max. Marks : 70**

1, (a) Define the following terms :

- (i) Event
- (ii) Impossible Event
- (iii) Union of two Events
- (iv) Independent Events

**OR**

If  $P(A) = 0.45$ ,  $P(B) = 0.65$  and  $P(A \cup B) = 0.75$ , then find :

- (i)  $P(A/B)$
  - (ii)  $P(A'/B')$
- (b) A box has 5 white, 4 black and 3 red balls. 3 balls are selected from it. Find the probability that;
- (i) All 3 balls are different colour
  - (ii) All 3 balls are of same colour

**OR**

Box I has 5 black and 5 white balls. Box II has 6 black and 4 white balls. One box is selected at random and from it one ball is drawn. Find the probability that a selected ball is of black colour.

- (c) A coin is tossed 3 times. Find the expected value of No. of tails occurred. **5**

**OR**

There are 1000 tickets and out of them one ticket bear a prize of ₹ 10,000. Each ticket costs ₹ 200. Find expected gain of a person if he will purchase one ticket.

2. (a) Five coins are tossed together. Find the probability of getting 4
- (i) all heads
- (ii) only one head

**OR**

In a binomial distribution, mean = 4 and variance =  $4/3$ . Find probability function of Binomial Distribution. Also find  $P(X = 2)$ .

- (b) For a Poisson variate if  $P(1) = P(2)$ , then find (i)  $P(X = 0)$  (ii)  $P(X = 3)$ . 5
- ( $e^{-2} = 0.135$ )

**OR**

The variance of Poisson variate is 0.81. Find (i)  $P(X = 1)$  (ii)  $P(X = 2)$ .  
( $e^{-0.81} = 0.449$ )

- (c) Write probability mass function of Binomial and Hypergeometric Distributions. Also write their mean and variance. 5

**OR**

From a pack of 52 cards, 4 cards are drawn one by one. Find the probability of getting atleast one king in them.

3. (a) Explain : 4
- (i) Probable Error
- (ii) Positive correlation
- (iii) Coefficient of Determination
- (iv) Regression coefficients

**OR**

State the difference between correlation and regression Analysis.

- (b) Find (i)  $byx$  (ii)  $bxy$  for given data : 5

x	1	5	3	2	1	2	7	3
y	6	1	0	0	1	2	1	5

**OR**

Find correlation coefficient for given data by Spearman's Rank correlation method :

x	3	-2	-1	6	4	-2	5	7
y	5	13	12	-1	2	20	0	-3

- (c) If  $n = 10$ ,  $\bar{x} = 30$ ,  $\bar{y} = 40$ ,  $\Sigma(x - \bar{x})^2 = 120$ ,  $\Sigma(y - \bar{y})^2 = 346$ ,  $\Sigma(x - \bar{x})(y - \bar{y}) = 193$ , then find equation of line of "y on x". Also estimate y if  $x = 100$ . 5

**OR**

If  $r_{12} = 0.8$ ,  $r_{13} = -0.4$ ,  $r_{23} = -0.56$ , then find

- (i)  $R_{1.23}$  (ii)  $r_{12.3}$

4. (a) State difference between control charts for variable and attributes. 4

**OR**

Write control limits for following :

- (i) np-chart

- (ii)  $\bar{X}$ -Chart

- (b) Draw an appropriate control chart for given data and give your conclusion : 5

$\bar{X}$ :	34	41	33	36	25	46	44	39
R :	11	7	10	11	19	14	12	15

( $A_2 = 0.58$ ,  $D_3 = 0$ ,  $D_4 = 2.12$ )

**OR**

Examining samples of 100 units during 10 days the no. of defective units are 2, 8, 0, 5, 6, 8, 12, 1, 3, 15. Prepare np-chart and see whether process is under control or not.

- (c) For SSP (100, 10, 1), find the probability of accepting a lot having 4% defective items. 5

**OR**

For a SSP (2000, 300, 3), find (i) ASN (ii) AOQ if  $p = 1\%$ . ( $e^{-3} = 0.0498$ )

5. Answer the following questions :

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- (1) If A and B are mutually exhaustive events then  $P(A \cup B) =$  \_\_\_\_\_.
- (2) If A and B are independent events then  $P(B/A) =$  \_\_\_\_\_.
- (3) If A and B are mutually exclusive events then  $P(A \cup B) =$  \_\_\_\_\_.
- (4) For a random variable X,  $E(X^2) = 21$ ,  $E(X) = 5$ . (True / False).
- (5) For a Binomial distribution if  $n = 10$ ,  $p = \frac{1}{2}$  then its S.D. = \_\_\_\_\_.
- (6) The mean and variance of Poisson variate are 2 and 3 respectively. (True / False)
- (7) Both lines of Regression are intersecting each other at \_\_\_\_\_.
- (8) Write the range of  $R_{3,12}$ .
- (9) If  $b_{12.3} = 0.18$ ,  $b_{21.3} = 2.73$  then  $r_{12.3} =$  \_\_\_\_\_.
- (10) What is sign of regression coefficient  $b_{yx}$  where  $y =$  price and  $x =$  Demand ?
- (11) In C-chart if  $\bar{C} = 4$  then find its UCL & LCL.
- (12)  $\bar{X}$  and R charts are based on \_\_\_\_\_ distribution.
- (13) For SSP (1000, 100, 2), if  $P_a = 0.2379$  then find its ATI.
- (14) In AOQ curve the maximum value of AOQ is called \_\_\_\_\_.