

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

**NF-116**

**November-2013**

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

**Statistics**

**Elementary Statistics**

**Time : 3 Hours]**

**[Max. Marks : 70**

1. (a) Define the following terms :

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- (i) Impossible Event
- (ii) Independent Events
- (iii) Sample Space
- (iv) Conditional Probability

**OR**

(a) Out of 100 persons, 65 are tea drinker while 45 are coffee drinker and 30 are both. Find the probability that,

- (i) There is either tea or coffee drinker.
- (ii) Neither tea nor coffee drinker.

(b) A box I contains 4 Red and 6 Blue balls. While box II contains 7 Red and 3 blue balls. A box is selected at random and from it one ball is selected. If it is known that selected ball is Red then find the probability that it is taken from box II.

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**OR**

(b) A problem of statistics is given to two students X and Y. Their chances to solve problem correctly are  $\frac{3}{5}$  and  $\frac{3}{4}$  respectively. Find the probability that,

- (i) A problem is solved correctly
- (ii) Any one will solve problem correctly

(c) If 3 coins are tossed together then find mean and variance of No. of tails occur on them.

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**OR**

(c) Find (i)  $E(2X - 1)$  (ii)  $V(2X - 1)$  from the following data :

<b>X = x :</b>	-2	-1	0	1
<b>P (X = x) :</b>	0.15	0.20	0.20	0.45

2. (a) If Mean and Variance of Binomial distribution are 4 and 2.4 then find 4  
 (i)  $P(X = 2)$  (ii)  $P(X > 0)$

**OR**

- (a) Assuming that boys and girls are equally probable. Find no. of families out of 1600 families each having 3 children with  
 (i) 2 boys (ii) 1 girl
- (b) A person has some cars and the average demand of cars per day is 3. Find the probability that on any day not more than 2 cars are in use. ( $e^{-3} = 0.0498$ ) 5

**OR**

- (b) Fit a poisson distribution to following data : ( $e^{-0.5} = 0.6065$ )

<b>X :</b>	0	1	2	3	4
<b>f :</b>	123	59	14	3	1

- (c) There are 50 screws of which 10 are defective. If 10 screws are taken at random from the packet then find the probability that only one is defective. Also find standard deviation of defective screws. 5

**OR**

- (c) 3 cards are selected from 52 cards. Find the probabilities that,  
 (i) all 3 cards are of club.  
 (ii) all 3 cards are queen.

3. (a) Find Spearman's rank correlation coefficient for given data : 4

<b>X :</b>	3	5	6	8	9	11
<b>Y :</b>	2	3	4	6	5	8

**OR**

- (a) Find Karl Pearson's correlation coefficient from the following data :

<b>X :</b>	36	23	27	28	28	29	30	31	33	35
<b>Y :</b>	29	18	20	22	27	21	29	27	29	28

(b) The regression equations are :

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$10x + 3y = 25$ ,  $6x + 5y = 31$  and  $v(x) = 4$  then find

- (i) Means of  $x$  &  $y$
- (ii) Value of  $x$  if  $y = 2$
- (iii)  $r_{xy}$
- (iv) S.D. of  $y$

**OR**

(b) From the following values find equation of line of "x on y".

$n = 5$ ,  $\bar{x} = 10$ ,  $\bar{y} = 20$ ,  $\Sigma(x - 4)^2 = 100$ ,  $\Sigma(y - 10)^2 = 160$ ,  $\Sigma(x - 4)(y - 10) = 80$ .

(c) If  $r_{12} = 0.91$ ,  $r_{23} = 0.81$ ,  $r_{13} = 0.33$ , then find

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- (i)  $R_{3.21}$
- (ii)  $r_{2.13}$

**OR**

(c) If  $\bar{x}_1 = 40$ ,  $\bar{x}_2 = 50$ ,  $\bar{x}_3 = 20$ ,  $S_1 = 3$ ,  $S_2 = 4$ ,  $S_3 = 2$ ,  $r_{12} = 0.4$ ,  $r_{23} = 0.5$ ,  $r_{31} = 0.25$ , then find equation of "X<sub>3</sub> on X<sub>1</sub> & X<sub>2</sub>".

4. (a) Draw  $\bar{X}$  & R charts and state your conclusion : ( $A_2 = 0.58$ ,  $D_3 = 0$ ,  $D_4 = 2.11$ )

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$\bar{X}$ :	43	49	37	44	45	37	51	46	43	47
<b>R :</b>	5	6	5	7	7	4	8	6	4	6

**OR**

(a) Examining samples of 100 units during 15 days the number of defective are :

4, 2, 8, 0, 4, 3, 5, 6, 8, 10, 12, 1, 3, 15, 9

Prepare np chart and state your decision.

(b) The number of defects in 20 units are :

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1, 4, 3, 2, 5, 4, 6, 7, 2, 3, 2, 5, 7, 6, 4, 5, 2, 1, 3, 8,

Decide whether process is in a state of control or not.

**OR**

(b) Draw O.C. Curve for a single sampling plan (100, 20, 1)

- (c) For a single sampling plan (50, 12, 1) find producer's risk and consumer's risk if AQL = 0.04 and LTPD = 0.08

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**OR**

- (c) For a single sampling plan (300, 50, 2)  
determine ASN, AOQ, ATI if incoming lot quality is 0.06 ( $e^{-3} = 0.0498$ )

5. Answer the following questions :

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- (1) Define : Mutually exclusive events
- (2) If  $P(A) = 0.70$ ,  $P(B) = 0.6$ ,  $P(A \cup B) = 0.85$ , then find  $P(B/A)$ .
- (3) If  $E(X) = 5$  and  $V(X) = 4$  then find  $E(X^2)$
- (4) If S.D. (X) = 10 then find  $V(3-2x)$
- (5) If Mean and variance of binomial distribution are 4 and 3 then find parameters of it.
- (6) What is relation between mean and standard deviation of Poisson distribution ?
- (7) Write probability mass function of hyper geometric distribution.
- (8) Define : Perfect positive correlation.
- (9) What is sign of regression coefficient involving in study of price and demand ?
- (10) If  $r_{12} = r_{23} = 0$  then find  $R_{2.13}$ .
- (11) For a control chart U.C.L. = 325, L.C.L. = 275 find C.L.
- (12) \_\_\_\_\_ distribution is used in p-chart.
- (13) Write control limits of np-chart.
- (14) Define : Consumer's Risk.