Seat No. : _____

TR-116

B.B.A.. Sem.-III
May-2013

CC-206 Elementary Statistics

Time : 3 Hours]   **[Max. Marks : 70**

1. (a) Define the following terms with suitable illustration :   **4**
   - (i) Difference of Events
   - (ii) Sample Space

    OR

    Define Mathematical expectation of random variable. State its properties.

   (b) If $P(A) = 0.7$, $P(B) = 0.6$, $P(A \cup B) = 0.5$ then find (i) $P(A/B)$ (ii) $P(A'/B')$.   **5**

    OR

    There are 3 black and 2 white balls. 2 balls are selected (i) with replacement (ii) without replacement. Find probability that both balls are of different colour.

   (c) Find $E(X)$ & $V(X)$ for following information :   **5**

X = x	0	1	2	3
P(X = x)	0.25	0.15	0.40	0.20

    OR

    If two coins are tossed together then find mean and variance of no. of tails.

2. (a) The probability that a student will solve the problem correctly is 0.40. Find probability that he will solve atleast 4 problems correctly out of 5 problems.   **4**

    OR

    For the Binomial Distribution, Mean = 20 and its S.D. = 2. Find $P(X > 1)$.

   (b) On an average 2.5 percent units are found to be defective. Find the probability that there are 4 defective units in a box of 100 units.   **5**

    OR

    Fit a Poisson distribution to the following data :

X :	0	1	2	3	4
f :	110	65	21	3	1

(c) There are 7 boys and 5 girls. Find probability that there are 2 boys if total 5 persons are selected. **5**

OR

A company has 8 Maruti cars and 7 Tata cars. If five cars are on hire then find mean and variance.

3. (a) Discuss the scatter diagram method to find correlation. **4**

OR

State difference between correlation and regression.

(b) Find rank correlation coefficient for following data : **5**

X :	75	42	88	44	95	65	70	79
Y :	120	65	134	68	150	71	115	135

OR

Obtain equation of "Y on X".

X :	11	7	9	5	8	6	10
Y :	7	5	3	2	6	4	8

(c) If $3r_{12} = 4r_{23} = 5r_{13} = 1$ and $S_1 = 10$, $S_2 = 8$, $S_3 = 5$ then find $r_{12.3}$ and $b_{12.3}$ **5**

OR

If $r_{12} = 0.9$, $r_{23} = 0.7$, $r_{13} = 0.8$, then find

(i) $R_{3.21}$

(ii) $r_{32.1}$

4. (a) Draw $\overline{X}$ and R charts for the following data : **7**

$\overline{X}$	24	28	30	35	20	14	18	20	22	29
R	3	5	4	1	8	9	5	2	10	3

($A_2 = 0.58$, $D_3 = 0$, $D_4 = 2.11$)

OR

15 samples each of 100 items are taken and no. of defective in each sample are :
4, 5, 3, 2, 3, 5, 1, 4, 7, 6, 0, 3, 2, 5, 1
Draw a suitable control chart and state your conclusion.

(b) For (50, 12, 1) find producer's risk and consumer's risk if AQL = 0.04, LTPD = 0.08 **7**

OR

Draw AOQ curve for (1500, 100, 1).

5. Answer the following questions :   **14**

    (1) Define Impossible Event.

    (2) If $E(X) = 3$ then find $E(2 - 3x)$

    (3) If $P(A) = 0.7$, $P(B) = 0.3$ and A, B are independent events then find $P(A \cup B)$.

    (4) If $\mu = 7$ and $\sigma = 1.25$ then find $E(X^2)$.

    (5) In Binomial distribution $n = 20$ and $p = \dfrac{1}{4}$ find its Standard Deviation.

    (6) Write probability mass function of Poisson Distribution.

    (7) State variance of Hyper Geometric Distribution.

    (8) If correlation between X and Y is 0.4 then find correlation coefficient between $(X - 5)$ and $(Y - 5)$.

    (9) If $r = 0.7$ and $n = 10$ then find its probable error.

    (10) If $r = -0.67$, $b_{xy} = -0.67$ then find b_{yx}.

    (11) If $b_{xy} = 0.45$, $S_x = 6.4$, $S_y = 8$ then find r_{xy}.

    (12) If $b_{12.3} = 0.18$, $b_{21.3} = 2.73$ then find $r_{12.3}$.

    (13) For C-chart if $\bar{c} = 10$ then find LCL & UCL for it.

    (14) Write the control limits for np-chart.

    Values :

    $e^{-1} = 0.368$, $e^{-2} = 0.135$, $e^{-3} = 0.049$, $e^{-4} = 0.018$, $e^{-0.5} = 0.607$

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