

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

# DE-102

December-2023

B.B.A., Sem.-III

CC-206 : Elementary Statistics

Time : 2½ Hours]

[Max. Marks : 70

- Instructions :** (1) Graph paper will be supplied.  
(2) Use of simple calculator is allowed.

1. (A) The probability that a student Aasha passed Mathematics is  $\frac{2}{3}$ , the probability that she passed Statistics is  $\frac{4}{9}$ . If the probability of passing atleast one subject is  $\frac{4}{5}$ , what is the probability that Aasha will pass both the subjects? 7

1. (B) Define Mathematical expectation and state its properties. 7

OR

1. (A) 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 the selected ball is of black colour. 7

1. (B) The probability distribution of a random variable X is given below. Find E(X) and V(X): 7

X :	8	12	16	20	24
P(X) :	$\frac{1}{8}$	$\frac{1}{6}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{1}{12}$

2. (A) Write the properties of Binomial Distribution and Poisson Distribution. 7
2. (B) 100 electric bulbs are found to be defective in a lot of 5000 bulbs. Find the probability that at the most 3 bulbs are defective in a box of 100 bulbs. [ $e^{-2} = 0.1353$ ] 7

OR

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P.T.O.

2. (A) For a binomial variate  $n = 8$  and  $16 P(X = 2) = P(X = 6)$ . Find the probability of success. 7

2. (B) 3 cards are selected from 52 cards. Find the probabilities that : 7

(i) all 3 cards are of club.

(ii) all 3 cards are queen.

3. (A) Define Regression coefficients and state their properties. 7

3. (B) Find Karl-Pearson's coefficient of correlation. 7

x	150	160	162	165	167	164	163	160	165	154
y	157	159	160	167	166	164	162	165	165	165

OR

3. (A) Write notes on : 7

(i) Multiple Correlation Coefficient

(ii) Partial Correlation Coefficient

3. (B) Find the regression equation of Y on X and X on Y from the following information : 7

X	28	41	40	35	33	46	32	36	33
Y	30	34	31	34	30	26	28	31	31

4. (A) Draw  $\bar{X}$  and R chart and decide whether production process is under control or not. 7

$\bar{X}$	40	42	41	40	42	43	40	40	42	45
R	3	2	5	2	1	4	3	2	5	4

$$[n = 5, A_2 = 0.58, D_3 = 0, D_4 = 2.11]$$

4. (B) For SSP (1500, 100, 2) find producer's risk and consumer's risk when it is given that AQL = 3% and LTPD = 6%. 7

$$[e^{-3} = 0.0498, e^{-7} = 0.000912]$$

OR

4. (A) Write short note on theory of runs. 7
4. (B) Draw an appropriate chart for the following data. State whether the situation is under control or not with the reason. 7

Observed items	150	150	150	150	150	150	150	150	150	150
No. of defective item	8	12	14	18	6	10	15	13	11	16

5. Give the following answer : (attempt any 7 out of 12) 14
- (i) The parameters of a binomial distribution are \_\_\_\_\_ and \_\_\_\_\_.
- (a)  $n, p$                       (b)  $m, pn$                       (c)  $np, n$                       (d) None
- (ii) If  $E(X) = 3$ , then  $E(3x + 9) =$  \_\_\_\_\_.
- (a) 20                      (b) 18                      (c) 9                      (d) None
- (iii) The Poisson Distribution is a distribution of \_\_\_\_\_ variable.
- (a) Random                      (b) Continuous                      (c) Discrete                      (d) None
- (iv) What is the other name of classical definition of probability ?
- (a) Axiomatic                      (b) Statistical                      (c) Mathematical                      (d) None
- (v) Mean and variance of binomial distribution are equal.
- (a) True                      (b) False
- (vi) The value of correlation coefficient is between \_\_\_\_\_ and \_\_\_\_\_.
- (a)  $-1$  &  $1$                       (b)  $1$  &  $1$                       (c)  $0$  &  $1$                       (d) None
- (vii) On which distribution C-chart is based ?
- (a) Normal                      (b) Poisson                      (c) Binomial                      (d) None
- (viii) If  $P_a = 0.92$ , what is Producer's risk ?
- (a) 0.92                      (b) 1                      (c) 0.08                      (d) None
- (ix) Which chart is used for controlling number of defects in a TV set ?
- (a) C                      (b) np                      (c) p                      (d) None

- (x) From the following who has given the binomial distribution for the first time ?
- (a) Jack Bernoulli (b) James Bernoulli  
(c) Fisher (d) None
- (xi)  $\bar{X}$ -chart is used for controlling on which variable characteristic ?
- (a) Average (b) Dispersion  
(c) Function defective (d) None
- (xii) If  $b_{12.3} = 0.1705$  and  $b_{21.3} = 2.7225$ , find  $r_{12.3}$ .
- (a) 0.5 (b) 1.5 (c) 0.6813 (d) None

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