AJEENKYA
D Y PATIL UNIVERSITY

End Term Examinations (April 2019)

School: School of Engineering **Program: BTECH (DS)**

Course: Statistics & Probability-II **Course Code: COM208**

Semester: IV **Max Marks: 50** **Duration (mins): 90 mins**

Section A

Q1 Fill in the Blanks. (Any Five) **10 Marks**

1) The mean of means is ………..
2) The product is said to be under the control if ……………
3) The formula for Binomial distribution is ………
4) Var (X) = …………..
5) Confidence limit between the two difference mean is of the form …………
6) Control limit value of proportion defective chart (p-chart) formed by ………….
7) Probability for Failure is written as ………….

Section B

Q2. Answer the following (Any Four) **20 Marks**

1) If X is normally distributed with mean 8 and S.D 4 find a) $p(5 \leq X \leq 10)$ b) $p(10 \leq X \leq 15)$ c) $p(X \geq 15)$ d) $p(X \leq 5)$

2) A random sample of 700 units from a large consignment showed that 200 were damaged. Find a) 99% and b) 95% confidence limits for the proportion of damaged units in the Consignment.

3) Out of 20,000 customer’s ledger accounts, a sample of 800 accounts was taken to test the accuracy of posting and balancing where in 52 mistakes were found. Assign limits within which the number of defective cases can be expected at 95% level

4) If the probability density of X I given by

$$\begin{aligned} \boldsymbol{f(x)} &= \frac{\boldsymbol{x}}{\boldsymbol{2}} \quad \boldsymbol{for\ 0 < x \le 1} \\ &= \frac{\boldsymbol{1}}{\boldsymbol{2}} \quad \boldsymbol{for\ \ 1 < x \le 2} \\ &= \frac{\boldsymbol{3-x}}{\boldsymbol{2}} \quad \boldsymbol{for\ 2\ < x < 3} \\ &= \text{o} \qquad \text{else where} \end{aligned}$$

Find the expected value of $\boldsymbol{f(x) = x^2 - 5x + 3}$

5) The theory predicts the proportion of beans, in the four group A, B, C, and D should be 9 : 3 : 3 : 1. In an experimental among 1,600 beans, the number in the four groups were 882, 313, 287, 118.Does the experimental result support the theory?
(The total value of $\aleph^2$ for 3 d.f at 5% level of significance is 7.81)

6) If X takes on the values 0 , 1 , 2 , 3 with probabilities $\frac{1}{125}, \frac{12}{125}, \frac{48}{125}, and\ \frac{64}{125}$

$find\ E(X), E(X^2) and\ E[(3X+2)^2]$

Section C

Q3. Answer the following (Any Two) **20 Marks**

1) The following data given the measurements of the axles of bicycle wheels.12 samples were taken so that each sample contains the measurements of 4 axles. The measurements which were more than 5 inches are given here. Obtain trail control limits for $\bar{X}$ and R charts and comment where the process is under control or not.

139	140	142	136	145	146	148	145	140	140	141	138
140	142	136	137	146	148	145	146	139	140	137	140
145	142	143	142	146	149	146	147	141	139	142	144
144	139	141	142	146	144	146	144	138	139	139	138

[For n = 4 , $A_2 = 0.73$, $D_3 = 0$, $D_4 = 2.28$]

2) Find the values of Linear Regression and correlation of following data :

X :	-1	1	2	4	6	7
Y:	-1	2	3	3	5	8

3) The following figures give the number of defectives in 20 samples, each sample containing 2,000 items.
425, 430, 216, 341, 225, 322, 280, 306, 337, 305,
356, 402, 216, 264, 126, 409, 193, 326, 280, 389.
Calculate the p-chart and comment if the process can be regarded in control of not?

4) Define the terms Bernoulli's distribution , Binomial distribution & Poisson distribution with Its conditions

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