

**S.S.DEMPO COLLEGE OF COMMERCE AND ECONOMICS,CUZIRA, ST.CRUZ GOA**

**S.Y.B.Com. Semester IV (Backlog) Examination, June 2017**

**Sub : \_Statistical Techniques, Duration : 2Hrs, Max. Marks : 80**

- Instructions :**
- 1. Attempt all the questions.**
  - 2. Figures to the RIGHT indicate FULL marks.**
  - 3. Graph paper will be provided on request.**
  - 2. Use of calculators is allowed.**
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Q.No.1 Answer the following (16)

a) State and prove multiplication theorem on probability (4)

b) For the data given below find Karl Pearson's coefficient of correlation. (7)

X	45	35	64	76	88	78	90
Y	25	34	38	52	45	62	30

c) For a Poisson distribution with mean 3, find (5)

i)  $P(x=0)$ , ii)  $P(x>1)$ , iii)  $P(x=2)$

Given ( $e^{-3} = 0.497, e^3 = 148.42, e^{-0.3} = 0.741, e^{\sqrt{3}} = 0.1827$ )

OR

Q.No. I. Answer the following (16)

x) What do you understand by Sample Space, State with example. (3)

y) Find Spearman's coefficient of Rank correlation for the data given below: (7)

X	45	55	44	45	38	45	55
Y	15	34	18	42	45	52	20

z) 50 tickets are consecutively numbered from 1 to 50. One ticket out of these is taken at random. What is the probability that the ticket will be multiple of 7 or 3? (6)

Q.No.2 Answer the following (16)

a) State any THREE properties of Poisson distribution. (3)

b) Find the missing value from the following data if the relationship between x and y is linear. (7)

X	15	30	24	38	45	?	10
Y	25	14	23	12	40	32	30

c) A large consignment of apples have 20% defective apples, A sample of 400 apples is selected from it, find the probability that the percentage of defective apples in the sample lies between 16% and 22%. (6)

( Given area between  $t=0$  and  $t=1$  is 0.3413 and the area between  $t=0$  and  $t=2$  is 0.4772)

OR

Q.No.II Answer the following (16)

x) State any THREE properties of normal curve. (3)

y) Find the line of regression of y on x and hence estimate y when  $x=90$ . (7)

X	85	65	75	68	88	78
Y	35	45	27	32	45	38

z) A large population has a mean height of 150 cms and a standard deviation of 20 cms. A random sample of size 100 is taken from this population. Find the probability that the sample mean will exceed 154 cms. (6)

( Given area between  $t=0$  and  $t=0.5$  is 0.1915 and the area between  $t=0$  and  $t=2$  is 0.4772).

Q. No.3. Answer the following. (16)

a) Write a short note on 'Correlation'. (3)

b) There are two bags, one of which contains 15 green and 5 white balls and the other 8 green and 10 white balls. A ball is to be drawn from either of the two bags. Find the probability of drawing a green ball. (6)

- c) In 400 tosses of a coin, head appears 280 times. Test the claim that the coin is unbiased at 5% l.o.s. (7)

OR

Q.No.III. Answer the following (16)

- x) State three points of difference between the algebraic and graphical method of finding correlation. (3)

- y) A card is drawn from a pack of well shuffled pack of cards. Find the probability that it is either a queen or a face card. (6)

- z) Twenty people were attacked by a disease and only 18 survived. Will you reject the hypothesis that the survival rate, if attacked by this disease is 85% in favour of the hypothesis that it is more at 5% level? (7)

Q. No 4. Answer the following. (16)

- a) Explain R chart (3)

- b) If the two regression lines are  $5y=3x-5$  and  $3y=5x+2$ , find  $\bar{x}$ ,  $\bar{y}$ ,  $r$ ,  $b_{xy}$  and  $b_{yx}$  (7)

- c) For a given sample of 200 items drawn from a large population, the mean is 65 and the standard deviation is 8. Find 99% confidence interval for population mean. (6)

OR

Q.No. IV. Answer the following (16)

- x) What are the advantages of Statistical quality control? (3)

- y) There are 1000 workers in a factory. The following are the results of height(X) and weight (Y) of these workers,  $\bar{X} = 68$ ,  $\bar{Y} = 150$ ,  $\sigma_x = 25$ ,  $\sigma_y = 20$ ,  $r=0.6$ . Estimate height of a particular factory worker whose weight is 100kgs. (7)

- z) A random sample of tennis balls selected from a large consignment of tennis balls gave 10% bad balls. Find 99% confidence limits for the percentage of bad balls in the consignment. (6)

Q.No.5 Answer the following (16)

a) Write a note on census survey. (3)

b) The income distribution of a group of 10,000 persons was found to be normal with mean Rs.750 and standard deviation Rs.50, what is the probability that the group has income

a) exceeding Rs. 668, b) less than Rs.832. (7)

( Given Area between  $t=0$  and  $t=1.64$  is 0.4382)

c)The following table gives the number of missing rivets noted at an aircraft final inspection.

Plot the C chart and comment.

(6)

Sample No	1	2	3	4	5	6	7	8	9	10
No. of missing rivets	24	26	29	34	14	35	23	18	20	12

OR

Q. No .V Answer the following (16)

x) What is quota sampling, give an example. (3)

y) It is observed that 80% of people prefer a particular brand of soap. What is the probability that at least 4 people in a random sample of 5 prefer that brand of soap. (6)

z) The following data gives the reading of 10 samples in the production of a certain component. Draw X chart. ( Given  $A_2=0.483$ ) (7)

Sample No	1	2	3	4	5	6	7	8	9	10
Sample Mean	25	34	26	14	18	20	10	15	32	12
Sample range	2	4	6	3	7	4	5	6	8	1