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**B.COM. (SEMESTER - IV) EXAMINATION, APRIL 2016  
STATISTICAL TECHNIQUES**

Duration: 2 hours

Marks: 80

**INSTRUCTIONS****1. All Questions are compulsory.**

Q1. a) Define the terms: i) Correlation  
ii) Regression. (3)

b) Find the two regression equations from the following data

$$x=23, y=35, x=2, y=3, \text{ and } r=0.6. \quad (6)$$

c) Find Karl Pearson's correlation coefficient for the following bivariate data:

X:	3	7	4	2	1	4	1	2
Y:	11	16	9	4	7	6	3	8

(7)

**OR**

Q1. x) Write the Properties of regression coefficients. (3)

y) Calculate Spearman's Rank Correlation Coefficient for following data.

X:	65	66	67	68	69	70	72
Y:	67	68	65	72	69	71	78

(6)

z) From the following bivariate data obtain regression equation of X on Y and also find value of X when Y is 15.

x:	6	2	10	4	8
y:	9	11	5	8	7

(7)

Q2. a) Define: i) Sample Space  
ii) Equally likely outcome. (3)

b) In a group of 125 students 70 passed in Maths 55 passed in Stats and 30 passed in both. What is the probability that a student selected at random has passed in atleast one subject? (6)

c) Compute Spearman's Rank correlation coefficient for the following data.

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

(7)

**OR**

Q2. x) Define the terms: i) Random Experiment ii) Event (3)

y) Two balls are drawn from a bag containing 5 white and 6 blue balls. Find the probability that both will be blue. (6)

z) For the following bivariate data obtain regression equation Y on X and Find Y when X=10.

x:	4	6	8	9	10
y:	10	11	13	17	20

(7)

Q3. a) Define the terms: i) Population  
ii) Sample. (3)

b) If a man purchases a raffle ticket, he can win a first prize of ₹ 5000 and second prize of ₹ 2000 with probabilities 0.001 and 0.003 respectively. What should be the fair price to pay for the ticket? (6)

c) If 5% of electric bulbs manufactured by a company are defective, use Poisson distribution to find the probability that in a sample of 100 bulbs  
i) No bulb is defective  
ii) 5 bulbs are defective  
(Given:  $e^{-5}=0.007$ ). (7)

**OR**

Q3 x) Define the terms: i) Census Enumeration  
ii) Sample Enumeration. (3)

y) A player tosses a coin twice. He wins ₹ 8 if 2 heads occur, ₹ 3 if 1 head occurs and loses ₹ 5 if no head occurs. Find his expected gain? (6)

z) A coin is tossed 6 times. What is the probability of getting  
i) no head  
ii) 4 heads. (7)

Q4 a) State four properties of Normal distribution. (3)

b) In a sample of 1000 T.V viewers 340 watch a particular programme. Find 99% confidence limits for the percentage of all viewers who watch this programme. (6)

c) The company claims that 90% of the refrigerators produced are defective. A sample of 6 refrigerators is chosen at random. What is the probability that  
i) There are no defective refrigerators  
ii) All are defective. (7)

**OR**

Q4 x) Write any three advantages of Normal distribution. (3)

y) If the mean of poisson distribution is 2 Find i)  $P(x=0)$  ii)  $P(x=1)$   
(Given :  $e^{-2}=0.1353$ ). (6)

z) A sample of 50 bulbs from a large consignment showed a mean life of 52 hours with a standard deviation of 4 hours. Find the limits within which the mean life of the bulbs lie almost certainly. (7)

Q5 a) Write a short note on control charts. (3)

b) The manufacturer claims that at least 95% of the items produced by its firm are good. An examination of 200 pieces of items revealed that 18 were defective. Test the claim at 5% level of significance? (6)

c) The following data gives the number of missing rivets noted at an aircraft final inspection. Plot a control chart for C and Comment. (7)

Aircraft No	1	2	3	4	5	6	7	8	9	10
No. of missing rivets	5	16	14	19	11	15	8	11	21	12

OR

Q5 x) Explain what do you understand by statistical quality control? (3)

y) A random sample of 100 bulbs selected from a large consignment gives the average life of 1500 hours with a standard deviation of 30 hours. Find 95% confidence limits for the average life of bulbs of that consignment. (6)

z) The following data refers to the number of defectives in 10 samples of sizes 100. Represent the data by P Chart and comment. (7)

Sample No.	1	2	3	4	5	6	7	8	9	10
No. of defectives	12	10	6	8	9	9	7	10	8	11

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