

Goa Vidyaprasarak Mandal's
GOPAL GOVIND POY RAITURCAR COLLEGE OF COMMERCE AND ECONOMICS
PONDA - GOA
B.COM. CBCS (SEMESTER - IV) SUPPLEMENTARY EXAMINATION
JUNE 2019

BUSINESS STATISTICS

Duration: 2 hours

Marks: 80

- INSTRUCTIONS :** i) Attempt all questions
ii) Figures to the right indicate full marks.
iii) Use of non-programmable calculator is allowed
iv) Graph paper will be supplied on request

Q 1. Answer the following:

- A. Explain the concept of regression. How does it differ from correlation? (3)
- B. A's chance of winning a game against B is $\frac{1}{3}$. Find his chance of winning at least 4 games out of 5. (6)
- C. There are 60 articles of which 20 are defective and 40 are non-defective. If a sample of 10 is selected, find the probability of getting exactly 4 defective and 6 non-defective articles. (7)

OR

Q 1. Answer the following:

- X. How do you interpret a calculated value of Karl Pearson's coefficient of correlation? Discuss in particular the values of $r = 0$, $r = -1$, $r = +1$. (3)
- Y. A coin is tossed four times. What is the probability of getting 2 or more heads? (6)
- Z. Two cards are drawn at random from a well shuffled pack of cards. Find the probability that i) both are hearts ii) one is black and one is red. (7)

Q 2. Answer the following:

- A. Define the terms i) Random experiment
ii) Independent events
iii) mutually exclusive events. (3)
- B. Calculate the coefficient of correlation by Karl Pearson's method from the following data:
- | | | | | | | | | |
|---|----|----|---|---|---|---|---|---|
| x | 3 | 7 | 4 | 2 | 1 | 4 | 1 | 2 |
| y | 11 | 16 | 9 | 4 | 7 | 6 | 3 | 8 |
- (6)

- C. The watches produced by a certain factory include only one defective watch in every 500 watches. 5 packs of 25 watches each are considered. Find the probability that in 5 packets there is i) exactly one defective watch ii) At least one defective watch
(Given $e^{-0.25} = 0.7788$) (7)

OR

Q 2. Answer the following:

- X. Explain the following terms giving examples
i) mutually exclusive events ii) Exhaustive events. (3)

Y. Calculate the coefficient of correlation by Karl Pearson's method from the following data:

x	5	9	13	17	21
y	12	20	25	33	35

(6)

- Z. If x is a random variable following Poisson distribution such that $P(x = 1) = P(x = 2)$. Obtain i) the mean of the distribution
ii) $P(x = 5)$
(Given $e^{-2} = 0.1353$) (7)

Q 3. Answer the following:

- A. A random sample of 700 units from a large consignment showed that 200 were damaged. Find 99% confidence limits for the proportion of damaged units in the consignment. (3)

B. Calculate Spearman's Rank Correlation Coefficient for following data.

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

(6)

- C. A sample of 100 households in a village is taken and the average income was found to be ₹628 per month with a standard deviation of ₹60 per month. Test the claim that the average income of all the people in the village is ₹640 per month at 1% L.O.S. (7)

OR

Q 3. Answer the following:

- X. A sample of 50 bulbs from a large consignment showed a mean life of 52 hours with standard deviation of 4 hours. Find the confidence limits within which the mean life of the bulbs lie almost certainly. (3)

Y. Find rank correlation coefficient between x and y from the following data

Singer	A	B	C	D	E	F
Rank by Judge I(x)	2	4	3	5	6	1
Rank by Judge II(y)	1	3	2	6	5	4

(6)

A wholesaler of eggs claims that only 4% of the eggs supplied by him are bad. A random sample of 600 eggs contained 36 bad eggs. Test the claim of the wholesaler at 5% L.O.S (7)

Q 4. Answer the following:

A. If the probability of Horse A winning the race is $\frac{1}{5}$ and the probability of Horse B winning the race is $\frac{1}{6}$, what is the probability that one of the horses will win the race? (3)

B. Find the missing value from the following data

x	2	3	7	10	12	15
y	18	16	10	?	13	11

(6)

C. Estimate the value of $f(3.4)$ from the following data

x	3	4	5	6
f(x)	31	69	131	223

(7)

OR

Q 4. Answer the following:

X. Out of a large production of articles, 20% are defective. If 5 articles are selected at random, find the probability that all are defective. (3)

Y. For a bivariate data, means of x and y are 20 and 45. The regression coefficient of y on x is 4 and that of x on y is $\frac{1}{9}$. Write down the two regression equations. Also estimate the value of x when y is 50. (6)

Z. Estimate the number of students in 1993 for the data given below

Year	1988	1990	1992	1994
No. of students	50	79	102	113

(7)

Q 5. Answer the following:

A. Define the terms i) Critical region ii) Level of significance (3)

B. The income of 10,000 persons is normally distributed with mean ₹6,000 and standard deviation ₹100. Find the numbers of persons having i) income between ₹5,800 and ₹6300 ii) income more than ₹5800.

(Given: Area under SNC between i) $t = 0$ and $t = 2$ is 0.4772

ii) $t = 0$ and $t = 3$ is 0.4987) (6)

C. Find the missing term in the following table

x	1	2	3	4	5
f(x)	1	3	9	?	81

(7)

OR

Q 5. Answer the following:

X. Explain Systematic sampling giving suitable example. (3)

Y. 20% of a large consignment of apples is found to be bad. Find the probability that at least 26% apples are bad in a sample of size 400 drawn from it.
(Given: Area under SNC between $t = 0$ and $t = 3$ is 0.4987) (6)

Z. For the data given below, use Lagrange's interpolation formula to find the value of $f(6)$

x	1	2	7	8
f(x)	4	5	5	4

(7)

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