

SARASWAT VIDYALAYA'S
SRIDORA CACULO COLLEGE OF COMMERCE & MANAGEMENT STUDIES
KHORLIM, MAPUSA, GOA

B.Com – Honors / B.Com - General (w. e. f. 2017-18)

S.Y.B.COM. SEMESTER END EXAMINATION, MAY/JUNE 2019

SPECIAL REPEAT SEMESTER IV

Subject:- BUSINESS STATISTICS - (GE-5)
(CBCS)

M.Marks:- 80
Duration:- 2 hrs.

Instructions:- 1. Attempt all the questions.

2. Attempt each question on a new page and sub-questions together.
3. No internal choice for sub-questions.
4. Use of non-programmable calculator is allowed.
5. Each question carries equal marks (3 + 6 + 7 =) 16
6. Log table /graph paper will be supplied on request.

Q.1. a) State Addition theorem on Probability for two mutually exclusive events A and B, associated with an experiment.

b) Marks of six students in class work and annual examination are recorded as follows. Comment on the correlation.

| | | | | | | |
|-------------|----|----|----|----|----|----|
| Class work | 12 | 14 | 23 | 18 | 10 | 19 |
| Annual exam | 68 | 78 | 85 | 75 | 70 | 74 |

c) Consider the function, $U_x = 7 - 5x + x^2$. Prepare a difference table for argument values of $x(=) 0, 2, 4, 6, 8, 10$. Comment on the difference table.

.OR.

Q.I. x) State the multiplicative theorem on probability. Also write the statement of theorem for two independent events.

y) Find the value of product moment coefficient of correlation from the following data:

$$n = 7, \sum x = 35, \sum y = 37, \sum xy = 219, \sum x^2 = 239, \sum y^2 = 215$$

z) From the following table, interpolate the missing figure.

| | | | | | |
|---------------------------|-----|-----|-----|---|-----|
| Year | 1 | 2 | 3 | 4 | 5 |
| Production (in '000 tons) | 200 | 220 | 260 | - | 350 |

Q.2. a) What are the advantages of Sampling?

b) Find most likely salary when service length is 10 yrs, using the following data

| | | | | | | | |
|-------------------------|----|----|----|----|----|----|----|
| Service length (in yrs) | 1 | 2 | 3 | 5 | 8 | 12 | 15 |
| Salary in hundreds | 16 | 18 | 21 | 23 | 26 | 29 | 31 |

c) In a marketing survey for the introducing new product in a town, a sample of 400 people were drawn. When they were approached for sale 80 of them purchased the product. Find 95% of confidence limit for percentage of person who would buy the product in the town.

.OR.

Q.II. x) Write a short note on “Multi stage sampling”.

y) Find the value of y when x = 2 for the following data if covariance is +1

| | | |
|----------|-----|-----|
| | X | y |
| Mean | 6 | 4 |
| Variance | 0.5 | 2.5 |

z) A sample of 600 persons selected at random from a large city gives the result that males are 53%. Is there a reason to doubt the hypothesis that males and females are equal in numbers (take appropriate value of α).

Q.3. a) State whether the following statement is true or false.

- i. For Binomial distribution number of trials should be finite.
- ii. For Poisson distribution, mean= Median=Mode.
- iii. For Standard Normal Variate, total area under the curve is unity

b) If the two regression lines for a bivariate data are $2x=y+15$ and $4y=3x+25$, find i) \bar{x} ii) \bar{y} iii) b_{yx} iv) b_{xy} and v) r

c) Using Newton's forward interpolation formula, find $\sin 48^\circ$, given that:
 $\sin 45^\circ = 0.7071$, $\sin 50^\circ = 0.7660$, $\sin 55^\circ = 0.8192$, $\sin 60^\circ = 0.8660$

.OR.

Q.III.x) State whether the following statement is true or false.

- i. For Poisson distribution number of trials should be infinite.
- ii. For Normal distribution, mean < Median < Mode.
- iii. Poisson distribution is a continuous probability distribution.

- y) Calculate rank correlation coefficient for the following data and hence comment on it.

| | | | | | | | | |
|----------|---|---|---|---|---|---|---|---|
| Judge I | 2 | 1 | 4 | 6 | 3 | 7 | 6 | 5 |
| Judge II | 2 | 1 | 3 | 6 | 4 | 8 | 5 | 6 |

- z) Interpolate the value of y when x = 3, by using Lagrange's interpolation formula for the following data

| | | | | |
|---|---|----|----|-----|
| x | 0 | 1 | 4 | 5 |
| y | 8 | 11 | 68 | 123 |

Q.4.a) Define the following terms:

- i) Type I error ii) Testing of hypothesis iii) Null hypothesis

b) If mean of a Binomial distribution is 6 and its variance is $3/2$, find the probability of 4 successes.

c) The probabilities that a man fishing at a particular place will catch 1, 2, 3, 4 fish are 0.4, 0.3, 0.2 and 0.1 respectively. What is the expected number of fish caught?

.OR.

Q.IV.x) Define the term Standard Error. Write down standard error for Sampling distribution of sample proportion.

y) Six coins are tossed simultaneously. What is the probability of getting:
i) 2 heads, ii) at least 2 heads.

z) The coefficient of Rank correlation between marks in statistics and marks in economics obtained by a certain group of students is 0.8. If the sum of the squares of the differences in ranks is given to be 33, find the number of students in the group.

Q.5.a) Draw different types of "Scatter diagrams".

b) In a printing press printing bills, the probability of printing errors is 2%. What is the probability that in a batch of 100 bills:

- i) None is rejected,
ii) Ten are rejected?

(Given that $e^{-2} = 0.8187$)

- c) A card is drawn from a pack of 52 cards. Find the probability that it is a
i) Heart or a red card ii) King or a Queen iii) Diamond

.OR.

Q.V.x) Differentiate between 'r' and 'R'. Symbols has usual meaning.

y) The income group of 10000 workers, were distributed normally with mean Rs 600 and the standard deviation Rs 100. Find

- i. The percentage of workers having income more than Rs 800.
- ii. The no of workers having monthly income less than Rs 400.

[Area under the standard normal curve $t=0$ to $t=2$ is 0.4772, $t=0$ to $t=0.2$ is 0.1793]

z) Two dice are thrown. Find the probability that the sum of the numbers on the uppermost faces is either even or perfect square.

