

**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, APRIL 2019
REGULAR SEMESTER IV**

Subject:- BUSINESS STATISTICS -II (GE-3)

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 will be supplied on request.

Q.1. a) Differentiate between Positive and Negative nature.

b) In a certain city 10000 electric bulbs were used for lighting. The average life of bulbs is 1000 hours with standard deviation of 200 hours. Find the number of bulbs expected to fail in the first 800 hours.
(Given: Area for s.n.v. z , between $z = 0$ to i) $z = 1$ is 0.3413,
ii) $z = 1.28$ is 0.4000).

c) An urn contains four white and five black balls, a second urn contains five white and four black balls. One ball is transferred from the first to the second urn, then a ball is drawn from the second urn. What is the probability that it is white?

.OR.

Q.I. x) Write down any four properties of coefficient of correlation.

y) Suppose the chest measurements of 800 boys are normally distributed with mean 66 cm, and standard deviation 5 cm. Find the number of boys with chest measurement –
i) between 65 and 70 cms.
ii) greater than or equal to 72 cms.
(Given: Area for s.n.v. z , between $z = 0$ to i) $z = 0.2$ is 0.0793,
ii) $z = 1.2$ is 0.3849,
iii) $z = 0.8$ is 0.2881).

- z) A committee of 6 members is to be formed from a group of, 7 men and 4 women. Calculate the probability that the committee will consist of
1. Exactly 2 ladies
 2. At least 2 ladies.

Q.2. a) Define the term mathematical expectation.

- b) Is there a correlation between heights and weights of six children?

Comment.

Ht in cms	120	125	127	130	134	144
Wt in kg	42	47	48	46	50	49

- c) Consider the function, $U_x = 7 - 5x + x^2$. Prepare a difference table for argument values of $x(=) 0, 1, 2, 3, 4, 5$. Comment on the difference table.

.OR.

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

- y) Find coefficient of correlation for the following data and comment on it:

Number of pairs of observations = 10

Total deviation of the x series from the mean = - 170

Total deviation of the y series from the mean = - 20

Total square deviations of the x series from the mean = 8288

Total square deviations of the y series from the mean = 2264

- z) Interpolate the missing figure from the following figures by using Binomial method of Interpolation

x	1970	1971	1972	1973	1974	1975
U_x	141	131	145	-	149	173

Q.3. a) Give two points of difference between sample survey and census survey.

- b) Calculate coefficient of correlation from the following result.

$n=10$, $\Sigma x = 100$, $\Sigma y = 150$, $\Sigma(x-10)^2 = 180$, $\Sigma(y-15)^2 = 215$, $\Sigma(x-10)(y-15) = 60$.

- c) 20 % of a large consignment of apples are found to be bad. Find the probability that at least 25% apples are bad in a sample of size 400 drawn from it. (Given: for s.n.v. z , area between (i) $z = 0$ to $z = 2.5$ is 0.4938)

.OR.

Q.III.x) What are the advantages of Sampling?

- y) In a partially destroyed laboratory record of correlation data, only the following data is legible:
- i) Variance of $x = 9$,
 - ii) Regression equations are: $8x - 10y + 66 = 0$ and $40x - 18y = 214$.
- Find the mean values of x and y and standard deviation of y .
- z) Candidate at an election claims 90% of support of all voters in a locality. Verify his claim if in a random sample of 400 voters from the locality, 320 supported his candidature. Use 5% level of significance.

Q.4.a) State whether the following statement is true or false. Write 'TRUE' for true statement and 'FALSE' for false statement.

- i. Mean and variance for the Binomial distribution is same.
- ii. Poisson distribution is the extended case of Binomial distribution.
- iii. For s.n.v. Z , $\sigma = 0$ and $\mu = 1$.

b) 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

- c) A newspaper editor rejects on an average 4 out of every 5 stories coming for Sunday edition. What is the chance that out of four stories received not even one is accepted.

.OR.

Q.IV.x) State whether the following statement is true or false. Write 'TRUE' for true statement and 'FALSE' for false statement.

- i. Mean and variance for the Poisson distribution is same.
- ii. Binomial distribution is the extended case of Poisson distribution.
- iii. For s.n.v. Z , $\sigma = 1$ and $\mu = 0$.

y) Find the value of y when x = 4 for the following data if $Cov(x,y) = 0.25$

	X	y
Mean	3	5
Variance	2.5	0.5

z) A variate X follows Poisson distribution with parameter 5. Evaluate

(i) $P(x=0)$, (ii) $P(x=1)$, (iii) $P(x \neq 0)$ (Given that $e^{-5} = 0.00674$, $e^5 = 148.41$)

Q.5.a) Define the following terms:

i) Testing of hypothesis ii) Null hypothesis

b) Find the value of U_{12} from the below table, Newton's Forward method of Interpolation

x	5	10	15	20
U_x	9.6	12.9	17.1	23.2

c) A bag contains 5 white and 7 black balls. A man draws out two balls from this bag. He receives Re. one for each black ball and Rs. two for each white balls that he draws. Find his expectation.

.OR.

Q.V.x) Differentiate between:

i) Statistics and Parameters.
ii) Null hypothesis and Alternative hypothesis.

y) Given: $f(1) = 2$, $f(2) = 4$, $f(3) = 8$ and $f(4) = 16$, find $f(5)$ using Lagrange's formula

z) A department store has 245 customers that are classified in the following table as regular and irregular and the mode of payment in cash or credit. For a randomly selected customer find:

i) $P(\text{Regular/Cash})$
ii) $P(\text{Irregular/Cash})$
iii) $P(\text{Credit/Irregular})$
iv) $P(\text{Cash})$

	Payment		Total
	Cash	Credit	
Regular	10	15	25
Irregular	20	200	220
Total	30	215	245

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