

**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, JUNE 2022
REGULAR SEMESTER IV**

Subject:- BUSINESS STATISTICS -II (GE-5 , CC : UCAG102)
(CBCS- Revised Course)

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

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

b) If for a binomial distribution $n = 6$ and $P(2) = P(4)$, then find mean and standard deviation of Binomial distribution.

c) What is the probability that a leap year will have:

- i) 53 Sundays.
- ii) 53 Sundays or 53 Mondays?

.OR.

Q.I. x) Define the term "Scatter diagram". Draw scatter diagrams for positive correlations.

y) If 5% of the electric bulbs are manufactured by a company are defective, use Poisson distribution to find the probability that in a sample of 100 bulbs:

- i) none is defective
- ii) five bulbs are defectives. (Given: $e^{-5} = 0.007$)

z) Refer the table below and answer the following questions:

Gender	Driver's status			
	Qualified	Learner	Non-driver	Total
Male	70	0	10	80
Female	90	10	20	120
Total	160	10	30	200

Find i) $P(\text{Learner/Male})$

ii) $P(\text{Qualified/Female})$

iii) $P(\text{Female/Qualified})$

iv) $P(\text{Male})$

Q.2. a) Define the following terms:

- i) Mutually exclusive events ii) Certain event iii) Sample Space

b) Draw a scatter diagram for the following data. Are the two variable correlated? Comment.

x	1	2	4	3	6	7
y	5	8	14	11	20	23

c) The mean life time of a 100 fluorescent tubes produce by a company is computed to be 1570 hours with a standard deviation of 120 hours. The company claims that the average life of the tubes produced by the company is 1600 hours. Using a level of significance of 0.05, is the claim acceptable?

.OR.

Q.II. x) State addition and multiplicative theorems on probability.

y) Calculate Karl Pearson's coefficient of correlation of the following data and comment on it.

Height	60	62	64	66	68	70	72
Weight	61	63	63	63	64	65	69

z) In a sample of 1000 TV viewers, 340 watch a particular programme. Find 99% confidence limits for the percentage of all viewers who watch this programme.

Q.3. a) Write down the sampling methods use in a statistical survey.

b) For the following data:

$$n=8, \Sigma x = 160, \Sigma y = 1760, \Sigma x^2 = 3920, \Sigma y^2 = 392330, \Sigma xy = 36640.$$

Find the regression coefficient for the above data.

c) A bag contains 5 red, 11 white and 7 black balls. Two balls are drawn at random from this bag. Find the probability that both are of different colours.

.OR.

Q.III. x) Write short note on Stratified random sampling.

y) Find regression line of y on x given the following data with three number of observations:

$$\Sigma x = 9, \Sigma y = 15, \Sigma xy = 49, \Sigma x^2 = 29, \Sigma y^2 = 83$$

Also estimate y when x = 5.

z) A problem in Statistics is given to three students P, Q, and R whose chance of solving it are $\frac{1}{3}$, $\frac{1}{4}$ and $\frac{1}{6}$ respectively. Find the probability that:

- i) Student P solve the problem
- ii) the problem will be solved.

Q.4. a) What are the requirements of Binomial distribution?

b) Find the value of y when $x = 38$ and the value of x when $y = 83$ for the following data if coefficient of correlation is $+0.7$

	X	Y
Mean	52	12
Variance	49	144

c) For a random variable x, Probability mass function is defined as:

$$\begin{aligned}
 P(x) &= \frac{1}{2} && \text{when } x = 1, 3 \\
 &= \frac{3}{10} && \text{when } x = 2 \\
 &= \frac{1}{5} && \text{when } x = 4 \\
 &= 0 && \text{otherwise}
 \end{aligned}$$

Find i) $P(2)$ ii) $P(x = 0)$ iii) $P(x \neq 0)$

.OR.

Q.IV. x) Give three examples where Poisson distribution is applicable

y) Find the value of \bar{x} and \bar{y} and r, given the following regression equations. $20x - 9y - 120 = 0$ and $25y - 20x + 25 = 0$. Find σ_x if $\sigma_y = 3$

z) The mean life of a large set of fluorescent tubes is 1570 hour with a standard deviation of 150 hours. A sample of 100 tubes is drawn from it with replacement. Find the probabilities that the mean life of these tubes will not exceed 1540 hrs.

(Given: For s.n.v. z, area between (i) $z = 0$ to $z = 2$ is 0.4772)

Q.5. a) Define the term standard error. Write down standard error for sampling distribution of sample mean.

b) If the height of 1000 soldiers in a regiment are distributed normally with a mean of 172 cm and a standard deviation of 5 cm, how many soldiers have height below 180 cm ?

(Given: Area for s.n.v. z, between $z = 0$ to $Z = 1.96$ is 0.4452)

c) From the following data Compute the coefficient of correlation between x and y:

Number of pairs of observations = 10

x series standard deviations = 22.20

y series standard deviations = 9.592

summation of the product of corresponding deviations of x and y from their respective means = -14.39

.OR.

Q.V. x) Define the following terms:

i) Type I error

ii) Testing of hypothesis

iii) Null hypothesis

y) The income of a group of 5000 persons were found to be normally distributed with mean Rs. 4000 and standard deviation of Rs. 250. Find the number of persons whose income lies between Rs. 3750 and 4375.

(Given: Area for s.n.v. z, between z = 0 to i) z = 1 is 0.3413

ii) z = 1.5 0.4332)

z) Calculate Rank correlation coefficient for the following data and hence comment on it.

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

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