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 2023

REGULAR SEMESTER IV (Offline Mode)

Subject:- BUSINESS STATISTICS -II (GE-5 , CC : UCAG102)   M.Marks:- 80

(CBCS- Revised Course)   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) Define the term standard error. Write down standard error for sampling distribution of sample mean.

b) A Sales Tax Officer has reported that the average sale of 500 businesses that he has to deal with during a year amounts to Rs. 36,000 with a standard deviation of Rs. 10,000. Assuming that the sales in these businesses are normally distributed, find
   i) the number of business the sales of which are over Rs. 40,000.
   ii) the percentage of business, the sales of are likely to range
       between Rs. 30,000 and Rs. 40,000
(Given: For s.n.v. z, area between (i) z = 0 to z = 0.4 is 0.1554
                                  (ii) z = 0 to z = 0.6 is 0.2257)

c) A player tosses 3 fair coins. He wins Rs. 5 if 3 heads appear, Rs. 3 if 2 heads appear and Re. 1 if 1 head occurs. On the other hand, he loses Rs. 15 if 3 tails occur. Find his expected gain.

.OR.

Q.I. x) Define H_1, H_0 and $\propto$ in statistics.

y) The distribution of monthly incomes of 500 workers may be assumed to be normal with mean of Rs. 2,000 and standard deviation of Rs. 200. Estimate the number of workers with incomes;
   i) exceeding Rs. 2,300 p.m.
   ii) between Rs. 1,800 and Rs. 2,300 p.m.
(Given: For s.n.v. z, area between (i) z = 0 to z = 1.5 is 0.4332
                                  (ii) z = 0 to z = 1 is 0.3413)

z) Find the Rank correlation coefficient of the following data;

Series A	115	109	112	87	98	98	120	100	98	118
Series B	75	73	85	70	76	65	82	73	68	80

Q.2. a) Two dice are rolled simultaneously. Let A: Sum of the numbers on the dice is at least 11. Write down the sample points in the event A.

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) From the following table, interpolate the missing figure.

X	5	10	15	20	55
$y = U_x$	30	32	-	38	40

.OR.

Q.II. x) Write down the statement of multiplicative theorem on probability for two independent events A and B, associated with an experiment.

y) For a bivariate data, the following data is given, find coefficient of correlation and comment on it.
$$\sum(x - \bar{x})(y - \bar{y}) = 47, \ \sum(x - \bar{x})^2 = 412, \ \sum(y - \bar{y})^2 = 53$$

z) Prepare a difference table for the function and comment on it,
$$f(x) = 2x^3 + 3x + 2, \qquad x = 0, 1, 2, 3, 4, 5.$$

Q.3. a) Write short note on Simple random sampling.

b) If $\bar{x} = 52$, $\bar{y} = 12$, $\sigma_x = 7$, $\sigma_y = 12$, r = 0.7 then find the value of y when x = 38 and the value of x when y = 83.

c) 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.

.OR.

Q.III. x) Write down any four Sampling methods use in Statistical survey.

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

x	1	2	6	9	12	15
y	7	9	17	23	29	35

z) A typist claim that she can type at an average rate of not lessthan 45 words per minute. A sample of 36 minute shows that the average speed is 44 words per minute with standard deviation of 6 words per minute at 5% level of significance. Comment.

Q.4. a) Complete the following statements.
   i. For _____ distribution mean and variance are same.
   ii. _____ distribution is a limiting form of Binomial distribution
   iii. _____ distribution is also called discrete probability distribution.

   b) Find regression of y on x given the following data with eight number of Observations:

   $\sum x = 40$, $\sum y = 32$, $\sum(x - \bar{x})(y - \bar{y}) = 16$, $\sum(x - \bar{x})^2 = 32$, $\sum(y - \bar{y})^2 = 16$

   Estimate y when x = -3.

   c) Given below are the population of a district in Asam in different years. Estimate the population with the help of Newton's forward interpolation formula for the year 1947

Year	1941	1951	1961	1971	
Population (in Lakh)	28.0	29.4	30.5	35.5	

.OR.

Q.IV.x) State at least three practical situations where Poisson distribution is used.

   y) Lines of regression of a bivariate population are given by:
      8x - 10y + 66 = 0 and 40x - 18y – 214 = 0.
      Find : i) The mean values of x and y.
             ii) Correlation coefficient of x and y.

   z) Estimate the value of y when x = 10 by using Lagrange's method

x	5	6	9	11
y	12	13	14	16

Q.5. a) Distinguish between Positive and Negative correlation.

b) If 5% of the electric bulbs 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: $e^{-5} = 0.007$)

c) One urn contains 6 white and 10 black balls. A second urn contains 8 white and 12 black balls. One ball is drawn at random from each of the urns. What is the probability that the balls drawn are both white?

.OR.

Q.V. x) Write short note on scatter diagram.

    y) Six coins are tossed simultaneously. What is the probability of getting:

        i) 2 heads,

        ii) at least 2 heads.

    z) i) If a coin is tossed 2 times, find is the probability of getting the same face?

        ii) Find the probability of an event A if odds in its favour are 3:2

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