# LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**B.Sc.** DEGREE EXAMINATION – **STATISTICS**

FIRST SEMESTER – **NOVEMBER 2022**

**UST 1501 – STATISTICAL METHODS**

Date: 24-11-2022 Dept. No. Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

## SECTION - A

**Answer ALL the Questions**

| | | | |
|---|---|---|---|
| **1.** | **Answer the following questions** | | **(5 x 1 = 5)** |
| a) | Write any two properties of a good measure of central tendency? | K1 | CO1 |
| b) | Explain Classification. | K1 | CO1 |
| c) | What is meant by Principle of least squares? | K1 | CO1 |
| d) | Give any two properties of correlation. | K1 | CO1 |
| e) | What is meant by Consistency of data? | K1 | CO1 |
| **2.** | **Fill in the blanks** | | **(5 x 1 = 5)** |
| a) | Statistics deals with only_____data. | K1 | CO1 |
| b) | Yearwise recording of data based on food production is said to be _____classification. | K1 | CO1 |
| c) | The Straight line is represented by the equation _____. | K1 | CO1 |
| d) | When the variables are more than two the correlation may be _____or_____. | K1 | CO1 |
| e) | If A and B are independent, Yule's coefficient Q will be equal to_____. | K1 | CO1 |
| **3.** | **Match the following** | | **(5 x 1 = 5)** |
| a) | Census - Attributes | K2 | CO1 |
| b) | Pie-Chart - Linear or non-linear | K2 | CO1 |
| c) | $\sum(Y - Y_e)^2$ - Sectors | K2 | CO1 |
| d) | Regression - Population | K2 | CO1 |
| e) | Association - Least | K2 | CO1 |
| **4.** | **True or False** | | **(5 x 1 = 5)** |
| a) | Diagrams do not give a birds eye view. | K2 | CO1 |
| b) | Quartile deviation is a positional measure | K2 | CO1 |
| c) | Moments about mean are called central moments. | K2 | CO1 |
| d) | Correlation lies between -1 and +1. | K2 | CO1 |
| e) | The association between two attributes in a sub-population is known as partial association. | K2 | CO1 |

## SECTION - B

**Answer any TWO of the following questions** **(2 x 10 = 20)**

| | | | |
|---|---|---|---|
| 5. | Explain Consistency of data and Independence of attributes with an example. | K3 | CO2 |
| 6. | Calculate Mean deviation about mean for the following data. | K3 | CO2 |

| No.of calls | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Frequency | 1 | 5 | 8 | 4 | 2 | 1 |

| | | | |
|---|---|---|---|
| 7. | (i) Explain in detail linear and non-linear curve under principle of least squares. **(5+5)** (ii)Explain Scatter Diagram. | K3 | CO2 |

8. Calculate the first four moments about mean for the following data. K3 CO2

| x | 35 | 45 | 55 | 65 | 75 | 85 | 95 |
|---|---|---|---|---|---|---|---|
| f | 1 | 3 | 11 | 21 | 43 | 32 | 9 |

## SECTION - C

**Answer any TWO of the following questions** **(2 x 10 = 20)**

9. Define Statistics and explain in detail about the collection of data and its types . K4 CO3

10. Obtain the lines of regression from the following data. K4 CO3

| X | 4 | 5 | 6 | 8 | 11 |
|---|---|---|---|---|---|
| Y | 12 | 10 | 8 | 7 | 5 |

11. (i) What is meant by Association of attributes? **(3+7)** K4 CO3
(ii) Find Rank Correlation coefficient.

| X | 10 | 8 | 1 | 2 | 6 | 9 | 3 | 5 | 4 | 7 |
|---|---|---|---|---|---|---|---|---|---|---|
| Y | 6 | 10 | 5 | 4 | 3 | 1 | 2 | 9 | 8 | 7 |

12. Calculate Karl Pearsons coefficient of Skewness from the data given below. K4 CO3

| x | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| f | 10 | 18 | 30 | 25 | 12 | 3 | 2 |

## SECTION - D

**Answer any ONE of the following question** **(1 x 20 = 20)**

13. The number of companies belonging to two areas A and B according to the amount of profits earned by them is given below. Draw Lorenz Curve. K5 CO4

| Profits earned(in 1000's) | 6 | 25 | 60 | 105 | 150 | 170 | 400 |
|---|---|---|---|---|---|---|---|
| Area A | 6 | 11 | 14 | 15 | 17 | 10 | 14 |
| Area B | 2 | 38 | 28 | 38 | 26 | 12 | 4 |

14. Find Karl Pearson's coefficient of Correlation. K5 CO4

| X | 50 | 60 | 58 | 47 | 49 | 33 | 65 | 43 | 46 | 68 |
|---|---|---|---|---|---|---|---|---|---|---|
| Y | 18 | 17 | 19 | 21 | 20 | 23 | 22 | 25 | 27 | 26 |

## SECTION - E

**Answer any ONE of the following question** **(1 x 20 = 20)**

15. **(i)** Fit a Straight line trend by the Method of least squares. **(10+5+5)** K6 CO5

| year | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|---|---|
| Production | 80 | 90 | 92 | 83 | 94 | 99 | 92 |

(ii)Explain Second degree parabola in detail
(iii)Explain Nominal, Ordinal and Interval scaling.

16. (i) Explain Yules coefficient of association also Calculate it **(10+10)** K6 CO5
when N=200,(A)=150, (AB)=120, ($\alpha\beta$)=10 .
(ii) The following numbers give the weights of 55 students of a class. Prepare a suitable frequency table:
42,74,40,60,82,115,41,61,75,83,63,53,110,76,84,50,67,65,78,77,56,95,68,
69,104,80,79,79,54,73,59,81,100,66,49,77,90,84,76,42,64,69,70,80,72,50,
79,52,103,96,51,86,78,94,71.

@@@@@@