

**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034****B.Sc. DEGREE EXAMINATION – STATISTICS****FIRST SEMESTER – NOVEMBER 2023****UST 1501 – STATISTICAL METHODS**

Date: 01/11/2023

Dept. No. 

Max. : 100 Marks

Time: 09:00 AM - 12:00 NOON

**SECTION A - K1 (CO1)****Answer ALL the Questions****(10 x 1 = 10)****1. Answer the following**

a) Define Statistics

b) State any two merits of Arithmetic mean

c) List the two normal equations of fitting of a straight line.

d) Define correlation

e) What is association of attributes?

**2. Fill in the blanks**

a) Cumulative frequency curve is also called \_\_\_\_\_

b) Mean deviation computed from a set of data is always \_\_\_\_\_ than standard deviation

c) Exponential curve is represented by the equation \_\_\_\_\_

d) Correlation lies between \_\_\_\_\_

e) Formula for Yule's coefficient of association is \_\_\_\_\_

**SECTION A - K2 (CO1)****Answer ALL the Questions****(10 x 1 = 10)****3. Match the following**

a) Primary data - Attributes

b) Pie Chart - Degree of relationship

c) Curve fitting - Diagrammatic representation

d) Correlation - Mailed Questionnaire

e) Manifold Class - Linear and non-linear

**4. True or False**

a) Statistics is a science.

b) The median is the most commonly used measure of central tendency.

c) Curve fitting is the process of specifying the model that provides the best fit to the specific curves depending on the given dataset.

d) A negative correlation means that as the X values decrease, the Y values also tend to decrease.

e) Yule's coefficient of association ranges from -1 to +1.

**SECTION B - K3 (CO2)****Answer any TWO of the following****(2 x 10 = 20)**

5. An analysis of production rejects resulted in the following data:

No. of rejects per operator	20-25	25-30	30-35	35-40	40-45	45-50	50-55
No. of operators	5	15	28	42	15	12	3

Calculate Mean and Standard deviation

6.	Explain the procedure to fit a straight line using the principle of least square										
7.	Calculate the rank correlation coefficient for the following data of marks of 2 tests given to candidates for a clerical job										
	Preliminary test	9	89	87	86	83	77	71	63	53	50
	Final test	8	83	91	77	68	85	52	82	37	57

8. Explain different methods of studying the association.

**SECTION C – K4 (CO3)**

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

9. List the requisites of Good Average

10.	The following data relate to length of service and income of the employees of an organization										
	length of service (years) (X)	11	7	2	5	8	6	10			
	income (Rs. '000) (Y)	7	5	3	2	6	4	8			

Compute the regression equation of Y on X

11. Analyse the procedure of fitting of second degree parabola

12. (i) Explain Yule's coefficient of association  
(ii) Calculate Yule's coefficient of association for the following data: (A) = 600; (B) = 800 ;(AB) = 480; N = 1000

**SECTION D – K5 (CO4)**

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

13.	(i) What is classification? Explain different types of classification with suitable example										
	(ii) Determine median and mode for the following data										
	Expenditure	40-60	60-80	80-100	100-120	120-130					
No. of families	50	250	500	100	50						

14.	(i) Fit an exponential curve of the form $Y = ab^x$ to the following data :										
	X	1	2	3	4	5	6	7	8		
	Y	1.0	1.2	1.8	2.5	3.6	4.7	6.6	9.1		
	(ii) Determine Karl Pearson's coefficient of correlation between infant mortality rate and female adult literacy rate for the following data										
	female adult literacy rate (%)	89	87	59	48	87	79	36	89	91	87
infant mortality rate (per '000)	31	23	28	56	28	70	79	12	18	19	

**SECTION E – K6 (CO5)**

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

15.	Calculate the first four moments about the mean and also the value of $\beta_1$ and $\beta_2$ from the following data										
	Marks	: 0-10	10-20	20-30	30-40	40-50	50-60	60-70			
	No. of Students:	8	12	20	30	15	10	5.			

16. The following table gives the aptitude test scores and productivity indices of 10 workers selected

at random

Aptitude test : 60 62 65 70 72 48 53 73 65 82

Productivity index: 68 60 62 80 85 40 52 62 60 81

Estimate (i) The productivity index of a worker whose test score is 92.

(ii) The test score of a worker whose productivity index is 75.

(iii) Find correlation coefficient.

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