



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc., DEGREE EXAMINATION – STATISTICS

FIRST SEMESTER – NOVEMBER 2013

ST 1502/ST 1500 – STATISTICAL METHODS

Date : 12/11/2013
Time : 1:00 - 4:00

Dept. No.

Max. : 100 Marks

PART – A

Answer **ALL** the questions:

(10 x 2 = 20)

1. Mention any two sources of secondary data.
2. How is median located graphically?
3. What is meant by semi inter quartile range?
4. Express the fourth central moment in terms of raw moments.
5. State the principles of least squares.
6. Write down the normal equations for fitting the curve $y=a+bx$ to a given data.
7. What is a scatter diagram?
8. When will the regression lines coincide?
9. What are the necessary conditions for consistency in a 2×2 table?
10. Define Yule's coefficient of association.

PART – B

Answer any **FIVE** questions:

(5 x 8 = 40)

11. What are the advantages of sampling over census method of collecting data?
12. Discuss the difference between classification and tabulation.
13. Represent the following frequency distribution using a frequency polygon.

Output in units: 300-310 310-320 320-330 330-340 340-350 350-360 360-370 370-380

No.of workers: 9 20 24 38 48 27 17 6

14. Explain the various measures of dispersion and their merits.
15. From the following frequency table of marks obtained by 22 students, calculate a measure of kurtosis

Marks : <10 <20 <30 <40 <50

No.of students: 3 8 17 20 22.

16. The rank of the same 15 students in two subjects A and B are given below, the two numbers within brackets denoting the ranks of the same student in A and B respectively:

(1,10),(2,7),(3,2),(4,6),(5,4),(6,8),(7,3),(8,1),(9,11),(10,15),(11,9),(12,5),(13,14),

(14, 12),(15,13). Use Spearman's formula to find the rank correlation coefficient.

17. The expected remaining life of an electronic part is believed to be related to the age of the part. The ages of 10 of these parts that were in use on a certain date were recorded in operating hours. When each part burned out, the elapsed time was recorded. The results were as follows:

Age of part (in hrs.) : 40 65 90 5 30 10 80 85 70 25

Remaining life (in hrs.) : 30 20 10 80 40 65 15 15 20 50

Fit a curve of the form $y=ab^x$.

18. In a market survey conducted to examine whether the choice of a brand is related to the income strata of the consumers, a random sample of 600 consumers reveal the following:

Income strata (Income per month)	Brand		
	1	2	3
< Rs 10000	132	128	50
Rs 10000-15000	62	60	28
Rs 15000-20000	30	30	26
Above Rs 20000	16	22	16

Examine whether the brand preference is associated with the income strata using an appropriate measure of association.

PART – C

Answer any **TWO** questions:

(2 x 20 = 40 marks)

19. (a) What is the need for diagrammatic representation of data? Explain the construction of one-dimensional diagrams. (12 marks)
- (b) What are the general rules for framing a questionnaire? (8 marks)
20. (a) A student observed customers buying tickets at a railway booking office. The times taken, in seconds, for customers paying by cash or credit card are tabulated as follows:
- Cash customers : 16 38 21 18 13 23 11 40 16 19 38 15 30 24 16
- Credit card customers: 55 43 52 50 57 54 59 54 67 65 60 60 66 55 59
- Which method of payment is consistent? (10)
- (b) Describe the various measures of skewness to describe statistical data. (10)
21. The following results are from an experiment in which the growth of a cell culture (optical density) is measured at different pH levels.

pH	3	4	4.5	5	5.5	6	6.5	7	7.5
Optical density	0.1	0.2	0.25	0.32	0.33	0.35	0.47	0.49	0.53

Calculate the regression coefficients and prove that the correlation coefficient is the geometric mean of the regression coefficients.

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