

Tribhuvan University
Institute of Science and Technology
2070



Bachelor Level/ First Year/ Second Semester/ Science

Computer Science and Information Technology (STA. 159)

(Statistics - II)

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Full Marks: 60

Pass Marks: 24

Time: 3 hours

All notation have usual meanings.

Group A

(2 x 10 = 20)

Answer any two questions

1. Describe the advantages of carrying out a sample survey in preference to a complete enumeration survey. Under what circumstances can complete enumeration be recommended in preference to a sample survey?
2. What is meant by Randomized block design? Give the analysis of variance of the design. What are the usual assumption made in the analysis of a Randomized block design?
3.
 - a) What is questionnaire? What are requisites of a good questionnaire?
 - b) What is Latin Square Design? Under what conditions this design can be used?

Group B

Answer any eight questions

(8 x 5 = 40)

4. A population of 800 is divided into 3 strata. Their sizes and standard deviations are given below:

	I	II	III
Number	300	300	300
Size	200	300	300
Standard deviation	6	8	12

A stratified random sample of size 120 is to be drawn from the population. Determine the sizes of sample from the three strata in case of

- a) Proportional allocation
 - b) Neyman's optimum allocation.
5. What do you understand by systematic sampling? What are the advantages of systematic sampling?
6. In PPS with replacement, show that an unbiased estimator of population total Y is

$$\hat{Y}_{PPS} = \frac{1}{n} \sum_{i=1}^n \frac{Y_i}{P_i}$$

Derive the expression for the variance

7. Clearly state the procedure of drawing a random sample in cluster sampling plan. In a simple random sampling without replacement of x cluster from a population of N clusters each containing M elements. Derive an unbiased estimator of the parameter $\bar{Y}$, population mean per element.