

Sample Survey (Unit 4) Paper 6.2

Contents:

Population, sample, parameter, sample vs complete enumeration, types of samples- simple random, stratified random and systematic sampling.

Sample Survey

Here, we define the following terms-

Population: Suppose we have a group of individuals with respect to certain characteristics under study. Then, this group of individuals is called a population with respect to the characteristics under study. For example, if we want to measure the mean height of the students of a college, then the students of the college will constitute a population with respect to the characteristics under study viz. mean height.

Finite Population: If a population contains a finite number of units then it is called a finite population. For example: Number of students in a college etc.

Infinite population: If a population contains infinite number of units then it is called an infinite population. For example: The population of pressures at various points of the atmosphere etc.

Hypothetical population: Sometimes a population can only be imagined without having any existence in reality. Such a population is called hypothetical population. For example: The outcome of the tossing of a coin for infinite number of times represents a hypothetical population of heads and tails.

Sample: The part of a population which is selected to study population characteristics is called a sample. For example: Suppose we want to measure the mean heights and weights of the 2000 students of a college. If we measure this characteristics from properly selected 200 students then this 200 students will constitute a sample.

Complete census: It refers to the enumeration of each and every individual of the population. The government of India makes a complete census of the people after every 10 years.

Sample survey: It refers to the enumeration of the units belonging to the sample only,

Parameter: By parameter we mean the characteristics of the population. We know that mean, variance etc. denote the characteristics of the population. So population mean, variance etc. are called parameters. Parameters are constant quantities.

Statistic: The functions of the sample values are called statistics. Let x_1, x_2, \dots, x_n are n values of a sample. If $T=t(x_1, x_2, \dots, x_n)$ Is a function of x_1, x_2, \dots, x_n then T is called a statistic. Therefore sample mean, sample variance are all statistics because they are the functions of the sample values. Since sample values are all variables therefore a statistic is also a variable.

Sampling variance: Let t be a statistic. The variance of T is called the sampling variance. The variance of any sampling distribution is also called sampling variance.

Standard Error: The positive square root of the sampling variance is called the standard error of the statistic.