

***Assignment***

**Subject:-**

**“**Probability and Statistics”

**Course Code:-**

“MA-250”

**Submitted to:-**

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BCS18-023

BSCS(Morning) 2nd Semester

**Q1: What is Sampling?**

**Ans: Sampling** is a statistical procedure that is concerned with the selection of the individual observation; it helps us to make statistical inferences about the population.

**Q2:** **What is population and Sample?**  
**Ans:** The main difference between a population and sample has to do with how observations are assigned to the data set.

* A **population** includes all of the elements from a set of data.
* A **sample** consists one or more observations drawn from the population.
* A measurable characteristic of a population, such as a mean or standard deviation, is called a **parameter;** but a measurable characteristic of a sample is called a **statistic.**
* We will see in future lessons that the mean of a population is denoted by the symbol **μ;** but the mean of a sample is denoted by the symbol x.

**Q3:** **What is sample random sampling?**  
**Ans:** Simple random sampling refers to any sampling method that has the following properties.

* The population consists of N objects.
* The sample consists of n objects.
* If all possible samples of n objects are equally likely to occur, the sampling method is called simple random sampling.

There are many ways to obtain a simple random sample. One way would be the lottery method. Each of the N population members is assigned a unique number. The numbers are placed in a bowl and thoroughly mixed. Then, a blind-folded researcher selects n numbers. Population members having the selected numbers are included in the sample.

**Q4:** **What is Stratified Sampling?**

**Ans:** With stratified sampling, the population is divided into groups, based on some characteristic. Then, within each group, a probability sample (often a simple random sample) is selected. In stratified sampling, the groups are called **strata.**

As a example, suppose we conduct a national survey. We might divide the population into groups or strata, based on geography - north, east, south, and west. Then, within each stratum, we might randomly select survey respondents.

**Q5:** **What is Systematic random sampling?**  
**Ans:** with systematic random sampling, we create a list of every member of the population. From the list, we randomly select the first sample element from the first k elements on the population list. Thereafter, we select every kth element on the list.

This method is different from simple random sampling since every possible sample of n elements is not equally likely.

**Q6:** **What is Cluster Sampling?**  
**Ans:** With cluster sampling, every member of the population is assigned to one, and only one, group. Each group is called a cluster. A sample of clusters is chosen, using a probability method (often simple random sampling). Only individuals within sampled clusters are surveyed.

Note the difference between cluster sampling and stratified sampling. With stratified sampling, the sample includes elements from each stratum. With cluster sampling, in contrast, the sample includes elements only from sampled clusters.