12D class **31/03/2020.** **08hrs to 10hrs.**

Statistics is the study of the collection, analysis, interpretation, presentation, and organization of data. In other words, it is a mathematical discipline to collect and summarize data.

According to **Merriam-Webster dictionary**, statistics is defined as "classified facts representing the conditions of a people in a state – especially the facts that can be stated in numbers or any other tabular or classified arrangement".

According to statistician **Sir Arthur Lyon Bowley,** statistics is defined as "Numerical statements of facts in any department of inquiry placed in relation to each other".

Difference between data and information

what is data: Data are plain facts. The word "data" is plural for "datum." When data are processed, organized, structured or presented in a given context so as to make them useful, they are called Information.

It is not enough to have data (such as statistics on the economy). Data themselves are fairly useless, but when these data are interpreted and processed to determine its true meaning, they becomes useful and can be named as Information.

Information is data that has been processed in such a way as to be meaningful to the person who receives it. it is any thing that is communicated.

Data is the term, that may be new to beginners, but it is very interesting and simple to understand. It can be anything like name of a person or a place or a number etc. Data is the name given to basic facts and entities such as names and numbers. The main examples of data are weights, prices, costs, numbers of items sold, employee names, product names, addresses, tax codes, registration marks etc.

Data is the raw material that can be processed by any computing machine

Mathematical Statistics

Mathematical statistics is the application of Mathematics to Statistics, which was originally conceived as the science of the state — the collection and analysis of facts about a country: its economy, and, military, population, and so forth.

Mathematical techniques used for this include mathematical analysis, linear algebra, stochastic analysis, differential equation and measure-theoretic probability theory.

Scope

Statistics is used in many sectors such as psychology, geology, sociology, weather forecasting, probability and much more. The goal of statistics is to gain understanding from data it focuses on applications and hence, it is distinctively considered as a Mathematical science.

Methods

The methods involve collecting, summarizing, analyzing, and interpreting variable numerical data. Here are some of the methods provided below.

- Data collection
- Data summarization
- Statistical analysis

Grouped and Ungrouped Data

. Formula & Examples

1. Arithematic mean $\bar{x}=\frac{\sum x}{n}$
2. Median M = $\frac{(n+1)th}{2}$ value of observation in ascending order
3. Mode is that value of the observation which occurs maximum number of times.

Examples

1. Calculate Mean, Median, Mode from the following data

3,13,11,15,5,4,2,3,2

Solution:

Mean $\bar{x}=\frac{\sum x}{n}$

=3+13+11+15+5+4+2+3+29

=58/9

=6.4444

Median :

Observations in the ascending order are :

2,2,3,3,4,5,11,13,15

Here, n=9 is odd.

M= value of $\frac{(n+1)th}{2}$observation

= value of $\frac{(9+1)th}{2}$ observation

= value of $5th$ observation

=4

Mode :

In the given data, the observation 2,3 occurs maximum number of times (2)

$\therefore Z$=2,3

Exercise

Calculate Mean, Median, Mode from the following data

85,96,76,108,85,80,100,85,70,95