PSYCHOLOGY B.A.1st year

Paper title:STATISTICS AND PSYCHOPHYSICS

UNIT – 1

Statistics is the study of the collection, analysis, interpretation, presentation, and organization of data. In other words, it is a mathematical discipline to collect, summarize data. However, there are two important and basic ideas involved in statistics; they are uncertainty and variation. The uncertainty and variation in different fields can be determined only through statistical analysis. These uncertainties are basically determined by the probability that plays an important role in statistics.

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".

Basics of Statistics

The basics of statistics include the measure of central tendency and the measure of dispersion. The central tendencies are mean, median and mode and dispersions comprise variance

and standard deviation.

Mean is the average of the observations. Median is the central value when observations are arranged in order. The mode determines the most frequent observations in a data set.

Types of Statistics

Basically, there are two types of statistics.

- Descriptive Statistics

- Inferential Statistics

In the case of descriptive statistics, the data or collection of data is described in summary. But in the case of inferential stats, it is used to explain the descriptive

one. Both these types have been used on large scale.

Descriptive Statistics

The data is summarised and explained in descriptive statistics. The summarization is done from a population sample utilising several factors such as mean and standard deviation. Descriptive statistics is a way of organising, representing, and explaining a set of data using charts, graphs, and summary measures. Histograms, pie charts, bars, and scatter plots are common ways to summarise data and present it in tables or graphs. Descriptive statistics are just that: descriptive. They don't need to be normalised beyond the data they collect.

Inferential Statistics

We attempt to interpret the meaning of descriptive statistics using inferential statistics. We utilise inferential statistics to convey the meaning of the collected data after it has been collected, evaluated, and summarised. The probability principle is used in inferential statistics to determine if patterns found in a study sample may be extrapolated to the wider population from which the sample was drawn. Inferential statistics are used to test hypotheses and study correlations between variables, and they can also be used to predict population sizes. Inferential statistics are used to derive conclusions and inferences from samples, i.e. to create accurate generalisations.

Levels of measurement:

Levels of measurement, also called scales of measurement.

There are four

levels of measurement:

- **Nominal:** the data can only be categorized

- **Ordinal:** the data can be categorized and ranked

- **Interval:** the data can be categorized, ranked, and evenly spaced

- **Ratio:** the data can be categorized,

ranked, evenly spaced, and has a natural zero.

NOMINAL :

You can categorize your data by labelling them in mutually exclusive groups, but there is no order between the categories.

- City of birth

- Gender

- Ethnicity

- Car brands

- Marital status

ORDINAL:

You can categorize and rank your data in an order, but you cannot say anything about the intervals between the rankings.

Although you can rank the top 5 Olympic medallists, this scale does not tell you how close or far apart they are in number of wins.

Interval level:
You can categorize, rank, and infer equal intervals between neighboring data points, but there is no true zero point.

The difference between any two adjacent temperatures is the same: one degree. But zero degrees is defined differently depending on the scale – it doesn't mean an absolute absence of temperature.

Ratio leve:

You can categorize, rank, and infer equal

intervals between neighboring data points, and there is a true zero point.

A true zero means there is an absence of the variable of interest. In ratio scales, zero does mean an absolute lack of the variable.

For example, in the Kelvin temperature scale, there are no negative degrees of temperature – zero means an absolute lack of thermal energy.