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| **SESSION** | **JULY-AUG 2024** |
| **PROGRAM** | **BACHELOR OF BUSINESS ADMINISTRATION (BBA)** |
| **SEMESTER** | **III** |
| **COURSE CODE & NAME** | **DBB2102 QUANTITATIVE TECHNIQUES FOR MANAGEMENT** |
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|  |  |

**Assignment Set – 1**

**1. Describe function of Statistics briefly.**

**Ans 1**

**Functions of Statistics**

Statistics plays a crucial role in various fields by enabling the systematic handling of numerical data. It is an essential tool for businesses, researchers, policymakers, and scientists to make informed decisions based on quantitative evidence. The functions of statistics can be broadly categorized into several key areas, each contributing to its overall utility and significance.

**Data Collection** The first function of statistics is the organized collection of data. This involves gathering numerical or categorical data from reliable sources using methods such as

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**2. Explain Classification of data and all its types.**

**Ans 2.**

**Classification of Data and Its Types**

Classification of data is a critical process in statistics that organizes raw data into structured categories, making it easier to analyze and interpret. This arrangement allows researchers, analysts, and businesses to uncover meaningful insights and apply the right statistical tools for analysis. Data can be classified in multiple ways based on its nature, source, purpose, arrangement, and measurement scale.

**1. Based on Nature of Data**

Data is primarily classified as qualitative or quantitative based on its nature:

**3a. Calculate the mean of the following frequency distribution:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Marks X** | **10** | **20** | **30** | **40** | **50** | **60** |
| **Frequency f** | **8** | **12** | **20** | **10** | **7** | **3** |

**b. Find Quartile one Q1 and Quartile three Q3 of the following series:**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Size:** | **4** | **4.5** |  | **5** | **5.5** | **6** | **6.5** | **7** | **7.5** | **8** |
| **Frequency:** | **10** | **18** |  | **22** | **25** | **40** | **15** | **10** | **8** | **7** |

**Ans 3.**

**a. Mean of the Given Frequency Distribution**

**Data:**

| Marks ($X$) | Frequency ($f$) |
| --- | --- |
| 10 | 8 |
| 20 | 12 |
| 30 | 20 |
| 40 | 10 |
| 50 | 7 |
| 60 | 3 |

**Formula to Calculate Mean:**

$$Mean\left(\overset{ˉ}{X}\right)=\frac{∑fX}{∑f}$$

Where:

* $f$ = frequency
* $X$ = marks
* $∑fX$ = sum of the products of frequency and marks
* $∑f$ = sum of all frequencies

**Steps:**

1. Multiply each value of $X$ (marks) by its corresponding frequency ($f$) to get $fX$.
2. Add all values of $fX$ to compute $∑fX$.

**Assignment Set – 2**

**1. Explain coefficient of correlation. Discuss the methods of calculating coefficient of correlation.**

**Ans 1.**

**Coefficient of Correlation**

The coefficient of correlation is a statistical measure used to evaluate the strength and direction of the relationship between two variables. It is widely applied in fields like business, economics, social sciences, and natural sciences to understand how changes in one variable are associated with changes in another. Denoted by $r$, the coefficient of correlation has values ranging between $-1$ and $+1$, where:

* $+1$ indicates a perfect positive correlation, meaning both variables move in the same direction.

**2. Describe components of time series analysis.**

**Ans 2.**

**Components of Time Series Analysis**

Time series analysis involves examining data collected over time to identify trends, patterns, and seasonal effects. It is widely applied in forecasting, planning, and understanding the dynamics of variables such as sales, stock prices, weather conditions, and economic indicators. Time series data is characterized by its chronological order, and its analysis involves decomposing the data into distinct components to better understand its structure.

**Trend Component** The trend component represents the long-term movement of data over an

**3a. Construct an index number for 2015 taking 2014 as base:**

|  |  |  |
| --- | --- | --- |
| **Commodity** | **Price in 2014** | **Price in 2015** |
| **A** | **90** | **95** |
| **B** | **40** | **60** |
| **C** | **90** | **110** |
| **D** | **30** | **35** |

**Ans 3a.**

**Constructing an Index Number**

An index number is a statistical tool used to measure the relative change in price, quantity, or value between two time periods. Here, we are tasked with calculating a price index for 2015 using 2014 as the base year.

**Formula for Simple Price Index:**

$$Price Index=\frac{Price in Current Year (2015)}{Price in Base Year (2014)}×100$$

**b. Write Short note:**

**(i) Parameter**

**(ii) Estimator**

**Ans b.**

**(i) Parameter**

A parameter is a numerical value that describes a characteristic of a population. It is a fixed value, although its exact value is often unknown because it pertains to an entire population, which is usually too large or inaccessible to study exhaustively. Parameters summarize key aspects of the population, such as mean, median, variance, or proportion. For example, the average height of all adults in a country is a parameter. Parameters are critical in statistical