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| **SESSION** | **JULY-AUGUST 2024** |
| **PROGRAM** | **MASTER OF BUSINESS ADMINISTRATION (MBA)** |
| **SEMESTER** | **1** |
| **COURSE CODE & NAME** | **DMBA109 STATISTICS FOR MANAGEMENT** |
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**Assignment Set – 1**

**1. What are the functions and limitations of Statistics?**

**Ans 1.**

#### ****Functions of Statistics****

Statistics is a branch of mathematics that involves the collection, organization, analysis, interpretation, and presentation of data. Its primary functions include:

**Data Collection**: Statistics provides systematic methods for gathering data from diverse sources, ensuring accuracy and reliability. Tools like surveys, experiments, and observational studies help collect meaningful data.

**Data Organization and Presentation**: Collected data is often vast and complex. Statistics organizes it into manageable forms, such as tables, charts, and graphs, making it easier to

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**2. A clerk calculated arithmetic mean of 50 values as 39.2. However, it was found that instead of taking two values as 25 and 32, he took them as 52 and 23. Find the corrected arithmetic mean.**

### Ans 2.

### Correcting the Arithmetic Mean

The arithmetic mean of 50 values was calculated as 39.2, but two incorrect values (52 and 23) were used instead of the correct values (25 and 32). We need to find the corrected mean.

#### Steps to Calculate the Corrected Mean:

**1 Calculate the Total Using the Incorrect Mean**:

$$Total=Mean×Number of Values$$

* Substituting the given values:

$$Total=39.2×50=1960$$

**2 Correct the Total**: The incorrect total includes the wrong values 52 and 23. To correct it,

**3. Define Following Terms:**

**• Mutually exclusive Events**

**• Independent Events**

#### Ans 3.

#### 1. Mutually Exclusive Events

Mutually exclusive events are events that **cannot occur simultaneously**. In probability theory, if two events are mutually exclusive, the occurrence of one event excludes the possibility of the other event happening.

##### Key Characteristics:

* If $A$ and $B$ are mutually exclusive events, then:

$$P\left(A∩B\right)=0$$

* This means the probability of both events occurring together is zero.
* The events have no common outcomes in a sample space.

**Assignment Set – 2**

**4. The data given below depicts the sales statistics of six sales representatives in two different localities. Find whether there is a relationship between the buying habits of the people in the localities.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Representative**  | **1**  | **2**  | **3**  | **4**  | **5**  | **6**  |
| **Locality I**  | **70**  | **40**  | **65**  | **110**  | **60**  | **20**  |
| **Locality II**  | **70**  | **30**  | **80**  | **100**  | **90**  | **20**  |

**Ans 4.**

### Analysis of Relationship Between Buying Habits in Two Localities

The given data represents the sales statistics of six sales representatives in two different localities. To determine the relationship between buying habits in Locality I and Locality II, we calculate the **Pearson Correlation Coefficient**.

### Data Table

| Representative | Locality I ($X$) | Locality II ($Y$) | $$X⋅Y$$ | $$X^{2}$$ | $$Y^{2}$$ |
| --- | --- | --- | --- | --- | --- |
| 1 | 70 | 70 | 4900 | 4900 | 4900 |
| 2 | 40 | 30 | 1200 | 1600 | 900 |
| 3 | 65 | 80 | 5200 | 4225 | 6400 |
| 4 | 110 | 100 | 11000 | 12100 | 10000 |

**5. Discuss the concept, objectives and assumptions of ANNOVA**

**Ans 5.**

**Concept of ANOVA**

Analysis of Variance (ANOVA) is a statistical method used to compare the means of three or more groups to determine if there are significant differences among them. It tests whether the variation among group means is greater than what would be expected by chance. Developed by Ronald Fisher, ANOVA extends the ttt-test for comparing two means to more than two groups, making it a critical tool in hypothesis testing when analyzing complex datasets.

ANOVA uses the **F-test** to evaluate the null hypothesis that all group means are equal. If the

**6. What are the components of time series? Bring out the significance of moving average in analysing a time series and point out its limitations.**

**Ans 6.**

**Components of Time Series**

Time series analysis examines data points collected over time to identify patterns, trends, and seasonality. The four main components are:

* **Trend**: This represents the long-term movement or direction of data over time, which could be upward, downward, or stable. For example, sales revenue may show a consistent increase over several years due to business growth.
* **Seasonality**: This is a repeating pattern at regular intervals, often due to factors like weather, holidays, or customs. For instance, ice cream sales increase in summer and