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| **SESSION** | **FEB – MAR 2025** |
| **PROGRAM** | **BBA** |
| **SEMESTER** | **III** |
| **COURSE CODE & NAME** | **DBB2102 QUANTITATIVE TECHNIQUES FOR MANAGEMENT** |
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**Assignment Set – 1**

**Q1 Elaborate on the characteristics of Statistics.**

#### **Ans 1.**

#### **Introduction to Statistics**

Statistics is a branch of mathematics that deals with the collection, classification, analysis, interpretation, and presentation of numerical data. In the context of management, statistics is a critical tool used for informed decision-making, forecasting, and strategic planning. It simplifies complex data and helps managers draw logical conclusions from it.

#### **Quantitative Nature of Statistics**

One of the fundamental characteristics of statistics is its quantitative nature. It deals primarily with numerical data and not qualitative information. Whether it’s sales figures, market share percentages,

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**Q2 Explain the methods of mean, median and mode for frequency data.**

#### **Ans 2.**

#### **Introduction to Central Tendency in Frequency Data**

In statistics, measures of central tendency are used to summarize a set of data with a single value that represents the center or average. The three main measures—mean, median, and mode—are especially useful when dealing with frequency distributions, where data is grouped in intervals and associated with frequencies. These methods help in understanding the overall pattern and tendencies in the data.

#### **Mean for Frequency Data**

The mean, or arithmetic average, for frequency data is calculated by multiplying each data value (or

**Q3 The values of X and Y are given below:**

**X 1 3 5 7 9**

**Y 9 7 5 3 1**

**Calculate the correlation coefficient between X and Y.**

**Ans 3.**

To calculate the correlation coefficient (r) between two variables $X$ and $Y$, we use Pearson’s correlation coefficient formula.

### **Step 1: Write the Given Values**

| X | Y |
| --- | --- |
| 1 | 9 |
| 3 | 7 |
| 5 | 5 |
| 7 | 3 |
| 9 | 1 |

### **Step 2: Use the Formula**

$$r=\frac{n∑XY-\left(∑X\right)\left(∑Y\right)}{\sqrt{[n∑X^{2}-\left(∑X\right)^{2}][n∑Y^{2}-\left(∑Y\right)^{2}]}}$$

Where:

* $n$ = number of observations
* $∑X$, $∑Y$ = sum of X and Y values

**Assignment Set – 2**

**Q4 The data below shows weekly sales: Week**

**Sales (Units)**

**Week 1 50**

**Week 2 55**

**Week 3 53**

**Week 4 54**

**Week 5 56**

**Week 6 58**

**Calculate the 3 - week moving average.**

**Ans 4.**

**Given Weekly Sales Data:**

| Week | Sales (Units) |
| --- | --- |
| Week 1 | 50 |
| Week 2 | 55 |
| Week 3 | 53 |
| Week 4 | 54 |
| Week 5 | 56 |
| Week 6 | 58 |

### **What is a 3-Week Moving Average?**

The **3-week moving average** is a time series forecasting method where the average of sales from **three consecutive weeks** is calculated to smooth short-term fluctuations and show trends more clearly.

**Q5 Explain different methods of random sampling.**

**Ans 5.**

**Random Sampling**

Random sampling is a fundamental technique used in statistics to select a sample from a larger population in such a way that every individual has an equal chance of being chosen. It helps in obtaining unbiased and representative data, which leads to more accurate and generalizable results in research and decision-making.

**Simple Random Sampling**

Simple random sampling is the most basic form of random sampling where each unit in the population has an equal and independent chance of being selected. This method can be conducted using random

**Q6 Define different methods for statistical quality control. Also, describe the advantages of statistical quality control.**

**Ans 6.**

**Statistical Quality Control (SQC)**

Statistical Quality Control (SQC) refers to the use of statistical methods to monitor and control the quality of products and processes. It involves collecting data from production processes and using statistical tools to identify, analyze, and correct variations in quality. SQC helps businesses maintain consistent product standards and reduce defects.

**Control Charts**

Control charts are graphical tools used to monitor process behavior over time. They help identify