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| **SESSION** | **APRIL2025** |
| **PROGRAM** | **BACHELOR OF COMPUTER APPLICATIONS (BCA)** |
| **SEMESTER** | **2** |
| **COURSE CODE & NAME** | **DCA1206 BASIC STATISTICS AND PROBABILITY** |
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**Set – I**

**Q1a. Define statistics and discuss its scope across different fields with examples.**

**b. Explain the process and importance of data classification, including the distinction between attributes and variables.**

**c. Describe the concept and advantages of frequency distribution in summarizing large datasets**

### ****Ans 1.****

### ****a. Statistics and Its Scope Across Fields****

Statistics is a scientific discipline that focuses on the collection, organization, analysis, interpretation, and presentation of data. It serves as an essential tool for drawing meaningful conclusions from data and plays a crucial role in decision-making under uncertainty. By transforming raw figures into useful information, statistics help individuals and organizations make informed decisions.

The scope of statistics is vast and covers numerous fields. In business, it is used for sales

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**Q2a. What is central tendency? Explain its purpose and the characteristics of a good measure.**

**b. Illustrate the calculation of median and mode for grouped and ungrouped data with suitable examples**

**c. Differentiate between arithmetic mean and weighted mean, and discuss their applications.**

Ans 2.

**a. Central Tendency: Purpose and Characteristics**

Central tendency refers to the statistical measure that identifies a single value as representative of an entire dataset. Its purpose is to provide a central or typical value around which the data points are distributed. Common measures of central tendency include the mean, median, and mode. Each of these measures helps summarize the dataset with a single figure, making it easier to compare and interpret data.

A good measure of central tendency possesses several key characteristics. It should be simple

**Q3a. What is dispersion? Discuss its significance and the difference between absolute and relative measures.**

**b. Explain how to calculate range, variance, and standard deviation using an example each.**

**c. Describe one practical scenario each where standard deviation and relative variance are important in decision-making.**

**Ans 3.**

**a. Dispersion: Meaning, Significance, and Types**

Dispersion refers to the extent to which data values in a dataset differ from the average (mean) or from each other. It measures the spread or variability of the data. If the data values are closely packed around the mean, dispersion is low, and if they are widely spread out, dispersion is high. Understanding dispersion is essential because averages alone do not reveal how much variability exists in a dataset.

The significance of dispersion lies in its ability to provide deeper insights into the

**Set – II**

**Q4a. Define the classical, empirical, and subjective approaches to probability. Explain their significance in analyzing uncertainty.**

**b. What is a sample space? Distinguish between finite, infinite, discrete, and continuous sample spaces with examples.**

**c. Define an event and discuss its role in probability theory, using a real-life situation.**

**Ans 4.**

**a. Classical, Empirical, and Subjective Probability**

**Classical probability** is based on logical reasoning where each outcome is equally likely. For example, the probability of getting a head in a fair coin toss is 1/2. This approach is used in games of chance like dice or cards where outcomes are known and symmetrical.

**Empirical probability** is derived from observed data or experiments. It is calculated as the number of times an event occurs divided by the total number of trials. For example, if it rained on 15 out of 30 days, the empirical probability of rain is 15/30 = 0.5. This method is

**Q5a. Differentiate deterministic, non-deterministic, and hybrid experiments with examples. How are these experiments used in probability analysis?**

**b. Explain the concept of expected value (EV). How is EV used in evaluating decision-making scenarios? Provide an example.**

**c. What are equally likely and exhaustive events? Illustrate how they influence probability calculations.**

**Ans 5.**

**a. Deterministic, Non-Deterministic, and Hybrid Experiments in Probability**

A deterministic experiment is one in which the outcome is certain and can be predicted with full accuracy. There is no element of chance involved. For example, calculating the sum of two numbers like 3 + 5 will always result in 8. Deterministic experiments are not random and are generally not the focus of probability analysis.

In contrast, a non-deterministic experiment (or random experiment) involves outcomes that

**Q6a. Explain the addition rule of probability. Differentiate mutually exclusive and non-mutually exclusive events with examples.**

**b. Describe the multiplication rule of probability with examples of independent and dependent events.**

**c. How are Bayes’ Theorem and conditional probability applied in practical decision-making problems?**

**Ans 6.**

**a. Addition Rule and Differentiation of Events**

The addition rule of probability is used to calculate the probability of the occurrence of at least one of two events. For two events A and B, the general addition rule is:

**P(A or B) = P(A) + P(B) – P(A and B)**.

If the events are mutually exclusive, meaning they cannot occur at the same time, then P(A and B) = 0, and the rule simplifies to:

**P(A or B) = P(A) + P(B)**.

For example, when rolling a die, the event of getting a 2 or a 5 is mutually exclusive; the