# Response to Multiple Choice Question

## A statistic is:

The correct answer is \*\*(A) a sample characteristic\*\*.

In statistical theory, a statistic is a function of the observed data (the sample). It is a quantity calculated from the sample data and provides information about the underlying population, but it is fundamentally a characteristic or property of the sample itself.

To elaborate further:

- A statistic is computed solely from the sample data without requiring knowledge of population parameters

- Common examples include the sample mean (x̄), sample variance (s²), sample proportion, and sample correlation coefficient

- Statistics serve as estimators of population parameters

- The sampling distribution of a statistic describes how the statistic varies across different samples from the same population

Answer (B) is incorrect because a population characteristic is called a parameter, not a statistic. Parameters are typically denoted with Greek letters (e.g., μ, σ², π) and are generally unknown fixed values that we try to estimate using statistics.

Answer (C) is incorrect because statistics are calculated values from observed data, not unknown quantities.

Answer (D) is incorrect because while some statistics (like the sample mean) may have approximately normal sampling distributions under certain conditions (per the Central Limit Theorem), not all statistics are normally distributed, and this property refers to their sampling distribution, not the definition of a statistic itself.