

## Proficiency Exam. Topics Covered.

- 1) Descriptive Statistics
  - a) Measures of Location: Mean, Median, Mode, Percentiles, Quartiles
  - b) Measures of Variability: Range, Interquartile Range, Variance, Standard Deviation, Coefficient of Variation.
  - c) Measures of Distribution Shape, Relative Location and Detecting Outliers: Distribution Shape, z-Scores, Chebyshev's Theorem, Empirical Rule, Detecting Outliers.
  - d) Measures of Association Between Two Variables: Covariance, Correlation Coefficient
- 2) Introduction to Probability
  - a) Experiments, Counting Rules, and Assigning Probabilities
  - b) Events and Their Probabilities
  - c) Basic Relationships of Probability
  - d) Conditional Probability
- 3) Discrete Probability Distributions
  - a) Random Variables
  - b) Discrete Probability Distribution
  - c) Expected Value and Variance
  - d) Binomial Probability Distributions
- 4) Continuous Probability Distributions
  - a) Uniform Probability Distribution
  - b) Normal Probability Distribution
- 5) Sampling and Sampling Distributions
  - a) Simple Random Sampling
  - b) Point Estimation
  - c) Sampling Distribution of the Sample Mean
  - d) Sampling Distribution of the Sample Proportion
- 6) Interval Estimation
  - a) Population Mean
  - b) Population Proportion
- 7) Hypothesis Tests
  - a) Null and Alternative Hypotheses
  - b) Type I and Type II Errors
  - c) Population Mean
  - d) Population Proportion
- 8) Comparisons Involving Means
  - a) Inferences About the Difference Between Two Population Means: Independent Samples
  - b) Inferences About the Difference Between Two Population Means: Matched Samples
- 9) Comparisons Involving Proportions
  - a) Inferences About the Difference Between Two Population Proportions
- 10) Simple Linear Regression
  - a) Simple Linear Regression Model
  - b) Least Squares Method
  - c) Coefficient of Determination
  - d) Model Assumptions
  - e) Testing of Significance: Estimate of the Variance, t-Test, Confidence Intervals for the Coefficients, F-test.