F.Y.BCom-Semester I
Mathematical and Statistical Techniques-I

[A] MATHEMATICS: (24 marks)

Unit I: Shares and Mutual Funds
a. Shares: Concept of share, face value, market value, dividend, equity shares, preferential shares, bonus shares. Simple examples.
b. Mutual Funds: Simple problems on calculation of Net income after considering entry load, dividend, change in Net Asset Value (N.A.V.) and exit load. Averaging of price under the Systematic Investment Plan (S.I.P.)

Unit II: Permutation, Combination and Linear Programming Problems:
a. Permutation and Combination: Factorial Notation, Fundamental principle of counting, Permutation as arrangement, Simple examples, combination as selection, Simple examples, Relation between r n C and r n P Examples on commercial application of permutation and combination.
b. Linear Programming Problem: Sketching of graphs of (i) linear equation Ax + By + C= 0 (ii) linear inequalities. Mathematical Formulation of Linear Programming Problems up to 3 variables. Solution of Linear Programming Problems using graphical method up to two variables.

[B] STATISTICS: (36 marks)

Unit III: Summarization Measures:

Unit IV: Elementary Probability Theory:
a. Probability Theory: Concept of random experiment/trial and possible outcomes; Sample Space and Discrete Sample Space; Events their types, Algebra of Events, Mutually Exclusive and Exhaustive Events, Complimentary events. Classical definition of Probability, Addition theorem (without proof), conditional probability. Independence of Events: \( P( A \cap B ) = P(A) P(B) \). Simple examples.
b. Random Variable: Probability distribution of a discrete random variable; Expectation and Variance of random variable, simple examples on probability distributions.

Unit V: Decision Theory:
Decision making situation, Decision maker, Courses of Action, States of Nature, Pay-off and Pay-off matrix; Decision making under uncertainty, Maximin, Maximax, Minimax
regret and Laplace criteria; simple examples to find optimum decision. Formulation of Payoff Matrix. Decision making under Risk, Expected Monetary Value (EMV); Decision Tree; Simple Examples based on EMV. Expected Opportunity Loss (EOL), simple examples based on EOL.