Indicative Syllabus

Entrance Test for Courses in Actuarial Science & Analytics

The examination paper will have multiple choice questions as well as subjective questions, duration of which will be 90 minutes.

Algebra

a) Manipulating algebraic expressions involving powers, logs, polynomials and rational expressions.
b) Solving simple linear/quadratic/simultaneous equations by methods of factorization, substitution, cancellation and expansion.
c) Solving simple linear inequalities.
d) Understanding and applying the $\sum$ and $\prod$ notations for sum and product.
e) Solving Arithmetic/Geometric Progression problems: General term and sum to 'n' terms.
f) Understanding telescopic sums.
g) Solving problems using the formulae Σn , Σn^2 and Σn^3.
h) Applying Binomial Theorem for a positive integer index: General term, number of terms and Binomial Coefficients.
i) Solving problems in Permutations and Combinations.
j) 2x2 Matrices: Addition, Subtraction, Multiplication, Transpose, Inverse and Determents.

Calculus

a) Functions: Domain and Range, Graphs of standard functions – Polynomials, Rational functions, Exponential/Log functions, $|x|$.
b) Standard limits $\lim_{x \to a} \frac{x^n - a^n}{x - a}$, $\lim_{x \to a} (1+x)^{\frac{1}{x}}$.
c) Derivatives as the slope of the tangent: Equation of a straight line.
d) Derivatives of standard functions including x^n, e^x, a^x, Ln x.
e) Derivatives of sum, product, quotient and function of functions (using chain rule).
f) Integrals of standard functions including x^n, e^x, a^x, Ln x.
g) Evaluating indefinite and definite integrals by substitution method.

Statistics

a) Descriptive Statistics: Types of Data, Tabular and Graphic representation of data, Numerical measures(Mean, Median, Mode, Range, Quartiles, Standard deviation etc.).
b) Probability: Definitions of experiment, trial and event, independent events, equally likely events, mutually exclusive events, axiomatic approach to probability, addition and multiplication rules on probability, conditional rule of probability, Bayes theorem, solving with simple examples.
c) Random Variables: Definition of a random variable, types of random variables, probability distribution of a random variable and probability function, Bernoulli and Binomial Distributions.
d) Correlation and Regression: Definition, types of correlation, correlation coefficient and its properties, definition of Regression, regression coefficients and their properties, relation between regression coefficients and correlation coefficient, construction of simple linear regression equations.