Syllabus for Statistics Bachelor's

Section 1: Subject Knowledge

Please Note: A Total of 26 Questions will be asked, combining the following topics, with the difficulty level commensurate to a Bachelor's Candidate.

Unit I: Calculus

Limits of functions of one real variable, Continuity and differentiability of functions of one real variable, Functions, Rolle's theorem and Lagrange's mean value theorems, Leibnitz's rule, Limits, Partial and total differentiation, Constrained optimization techniques, Leibnitz's rule, Integral.

Unit II: Matrix Algebra

Vector spaces, subspaces, and linear independence, Algebra of matrices, Determinants, Adjoint and inverse of a matrix, and related properties, Rank of a matrix and row operations, System of linear equations, Cramer's rule and vectors, Cayley Hamilton theorem.

Unit III: Probability

Random experiments, sample space, Axiomatic and relative frequency, Addition theorem, conditional probability, Bayes' theorem, Geometric probability, Boole's and Bonferroni's inequalities, Probability density function (p.d.f.), Central Tendencies.

Unit IV: Standard discrete and continuous univariate distributions

Degenerate, Bernoulli, binomial, negative binomial, geometric, Poisson, hypergeometric, uniform, exponential, double exponential, gamma, beta, normal, and Cauchy distributions, Moment generating function (m.g.f.) and its properties, Markov and Chebyshev inequalities, Bivariate normal distribution.

Unit V: Stochastic process

Probability Distributions, Markov Chains, Poisson Process, Queuing System.

Unit VI: Estimation

Point Estimation, Maximum Likelihood Estimation, Bayesian Estimation, Interval Estimation, Bayesian Estimation, Minimum variance unbiased estimator.

Unit VII: Testing of hypothesis

Unbiasedness, sufficiency, completeness, consistency, and relative efficiency of estimators, Maximum likelihood estimation, Confidence intervals for parameters of normal and exponential distributions, Null and alternative hypotheses, Test statistics, type I and type II errors, and power of a test.

Unit VIII: Non Parametric statistics

Test for randomness, Empirical distribution functions, Kolmogorov Smirnov test, Sign test, Wilcoxon-Mann-Whitney test, Kruskal-Wallis test.

Unit IX: Multivariate analysis

Joint and marginal c.d.f.s, p.m.f., Conditional c.d.f., p.m.f., and p.d.f, Independence of random variables, Distribution of functions of random vectors, Mathematical expectation and moments of functions of random vectors, Joint moment, Conditional moments, Additive properties of binomial. Unit X: Regression analysis

Simple regression analysis, Multi Linear Regression, Assumptions of Regression Analysis, Diagnostic Test, and Time series analysis.

Section 2: Fundamental Skills

Please Note: A Total of 28 Questions will be asked, combining the following topics, with the difficulty level commensurate to a Bachelor's Candidate.

Unit I: Data Analysis Unit II: Math and Statistics Unit III:Lab Skills Unit IV: Reading and Writing

Section 3: Specific Skill Proficiency

This section has more than 30 skills. You can select the ones you are proficient in from the enrollment form. You can choose a maximum of 2 skills. Each skill contains 10 questions.