

SYLLABUS for Ph.D. ENTRANCE TEST
in
STATISTICS, DAVV, Indore (2021-22)

PART-B

Part-B shall also consist of 50 objective type compulsory questions of 1 mark each based on the syllabus of the subject at Masters Level as follows:

(i) Statistical Methods

Measures of location, Dispersion, Skewness and Kurtosis, Raw and central moments, Correlation, Regression: Simple linear, Regression, curvilinear regression, multiple linear regression, partial and multiple correlation coefficients.

Discrete Distributions: Bernoulli, Binomial, Poisson, Geometric, Negative Binomial, Hypergeometric, Multinomial Distribution

Continuous Distributions: Normal, Uniform, Lognormal, Exponential, Beta, Gamma.

(ii) Probability and Distribution Theory

Definitions, Limitations and constraints of various definitions, Theorems, Additive, Multiplicative laws, conditional probability, Bayes Theorem with Applications.

Distribution Theory : Distribution function, continuous and discrete

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distributions, cdf, pdf, pmf, properties thereof, obtaining cdf from pdf/pmf and vice versa. Joint, marginal and conditional distribution, Expectation, Independence of random variables, Distributions of sums of iid random variables. Chi-square, t, F and Z distribution and tests based on them.

(iii) Statistical Inference:

Properties of good estimators: unbiasedness, efficiency, sufficiency, consistency ;
Estimation: Method of least squares, Method of Maximum Likelihood, Method of moments, Interval Estimation, Confidence Intervals . Tests of Statistical Hypothesis:
Basic definitions: Statistic, parameter, test statistic, sampling distribution, Types of hypotheses: null and alternative, simple and composite, one sided and two-sided tests.

Parametric Tests: Types of errors, size of test, power of test and their calculation: . Neymann-Pearson tests for simple and composite alternative hypotheses, Distribution with monotone likelihood ratio property. Likelihood ratio tests.

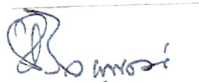
Nonparametric Tests: Sign test, Run tests, Rank tests, median test, Chi-square tests Kolmogorov Smirnov Tests

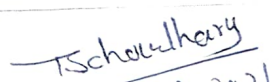
(iv) Design of Experiments:

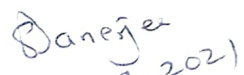
Linear models and complete designs (CRD, RBD, LSD) under fixed, mixed and random effects model, factorial experiments, confounding in 2^n factorial experiments, Incomplete Block designs, BIBD, ~~BBBD~~, Properties and applications.

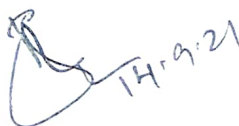
(v) Operations Research:

Scope and limitations, general OR model linear Programming Problems and their solutions under different conditions, simplex method. Artificial basis technique Non-Linear Programming problems, Deterministic and stochastic Inventory models.


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