17SH1101 - PROBABILITY, STATISTICS AND COMPUTATIONAL TECHNIQUES

Instruction/week: 4 hrs.   Max. Sessional marks: 40
Univ. Exam: 3 hrs.   Univ. Exam marks: 60

UNIT - I

PROBABILITY, RANDOM VARIABLES AND DISTRIBUTIONS: Sample space and events, probability, the axioms of probability. Random variables, Discrete distribution, Continuous distribution, Binomial distribution, Poisson distribution, Normal distribution, Normal approximation to Binomial distribution.

UNIT - II

TESTING OF HYPOTHESIS: Tests of hypothesis point estimations, interval estimations. Large samples, null hypothesis, alternative hypothesis, critical region, confidence interval for mean, difference between the means, single proportion and difference of proportions. t - distribution, F-distribution and Chi-square distribution.

UNIT - III

SOLUTIONS OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS: Bisection method, Regular Falsi method, Iteration method, Newton Raphson method.

INTERPOLATION: Newton's forward interpolation, Newton's backward interpolation, interpolation with unequal intervals, Lagrange's interpolation, Newton's divided difference interpolation. Derivatives using Newton's forward formula, derivatives using Newton's backward formula.

UNIT - IV

CURVE FITTING AND NUMERICAL INTEGRATION:*Curve fitting*: Fitting a straight line, second degree curve, exponential curve, power curve by method of least squares. Numerical integration, Newton cote's formula, Trapezoidal rule, Simpson's 1/3 rule, Simpson's 3/8 rule.

UNIT - V

NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS: Single step methods: Taylor's series method - Euler's and modified Euler's methods - fourth order Runge-Kutta method for solving first and second order equations multi step methods: Milne's and Adam's, predictor and corrector methods.

TEXT BOOKS:

1. Grewal B.S (2007), Higher Engineering Mathematics, 40th edition, Khanna Publishers, New Delhi.

2. Iyengar T. K. V., Krishna Gandhi B. & Others (2011), *Probability and Statistics*, 3rd Revised Edition, S. Chand &Company Limited, New Delhi.

REFERENCES:

1. Iyengar T. K. V., Krishna Gandhi B. & Others (2011), Mathematical Methods, 6th Revised Edition, S. Chand &Company Limited, New Delhi.

2. Bali N. P, NarayanaIyengar N. Ch (2004), A Textbook of Engineering Mathematics, 6th edition, Laxmi Publications, New Delhi.

3. Sastry S. S (2005), Introductory Methods of Numerical Analysis, 4th Edition, Prentice Hall of India Learning Pvt. Ltd, New Delhi.