

ENGINEERING MATHEMATICS – III

Lectures : 4 Periods/Week

Sessional marks : 40

Semester End Exam. : 3 Hours

Semester End Exam. Marks : 60

Credits: 4

Course objectives :

- To study the formation of partial differential equations
- To study numerical integration and numerical solution of first-order ordinary differential equations
- To study probability concept and distributions
- To study complex variable functions, analyticity of complex functions and complex integration

Course outcomes :

- Learn formation of partial differential equations and solution of partial differential equations
- Solve algebraic and transcendental equations numerically
- Solve one dimensional heat, wave and Laplace equations
- Determine analytic functions and non analytic functions and evaluate real definite integrals by complex integration

UNIT- I

Partial Differential equations

Partial differential equations – Introduction, Formation ; Solution of partial differential equations – Linear equations of first order , Non-linear equations of first order (standard type); Method of separation of variables – Solution of one dimensional heat, wave equations and Laplace equations

UNIT- II

Numerical Methods

Solution of algebraic and transcendental equations – Introduction, Bisection method, Method of false position, Iteration method, Newton's Raphson method; Numerical Integration – Trapezoidal rule, , Simpson's 1/3 rule, 3/8 rule ; Numerical solution of first-order ordinary differential equations – Picard's method, Taylor's series method, Euler's method (simple) , R-K method of 4th order

UNIT- III

Probability and Distributions

Definition of probability and conditional probability ; Addition theorem , Multiplication theorem , Baye's theorem, ; Random variables – Binomial , Poisson and Normal distributions

Complex variables

Introduction –Limit, derivative of a functions of complex variable; Analytic functions; Harmonic functions.

UNIT - IV

Complex variables (Continued)

Complex integration –Cauchy’s theorem , Cauchy’s integral formula; Taylor’s series and Laurent’s series (without proof) ; Zeroes and singularities; Residues –Residue theorem , Calculation of residues .

NOTE

Two questions of 12 marks each will be given from each unit out of which one is to be answered. Twelve questions of one mark each will be given from entire syllabus which is a compulsory question.

TEXT BOOKS

1. Higher Engineering Mathematics by B S Grewal, 40th Edition, Khanna Publishers

REFERENCE BOOK

1. Advanced Engineering Mathematics by Erwin Kreyszig, 8th Edition, John Wiley & Sons