

Notes:

1. In the examination, each student picks one question from the lot of questions, either from Part-A or from Part-B. About half the students in the batch are to get a question from Part-A while the rest are to get the question from Part-B.
2. Any simulation package like MultiSim / Pspice etc may be used.

IV SEMESTER

ENGINEERING MATHEMATICS IV (Common to CSE & ISE)

Subject Code: 10MAT41
Hours/Week : 04
Total Hours : 52

I.A. Marks : 25
Exam Hours: 03
Exam Marks: 100

PART – A

UNIT – 1

6 Hours

Numerical Methods: Numerical solutions of first order and first degree ordinary differential equations – Taylor's series method, Modified Euler's method, Runge – Kutta method of fourth order, Milne's and Adams-Bashforth predictor and corrector methods (All formulae without Proof).

UNIT – 2

7 Hours

Complex Variables: Function of a complex variable, Limit, Continuity Differentiability – Definitions. Analytic functions, Cauchy – Riemann equations in cartesian and polar forms, Properties of analytic functions. Conformal Transformation – Definition
Discussion of transformations: $W = z^2$, $W = e^z$, $W = z + (1/z)$, $z \neq 0$
Bilinear transformations.

UNIT – 3

6 Hours

Complex Integration: Complex line integrals, Cauchy's theorem, Cauchy's integral formula. Taylor's and Laurent's series (Statements only)
Singularities, Poles, Residues, Cauchy's residue theorem (statement only)

UNIT – 4

7 Hours

Series solution of Ordinary Differential Equations and Special Functions: Series solution – Frobenius method, Series solution of Bessel's D.E. leading to Bessel function of first kind. Equations reducible to Bessel's

D.E., Series solution of Legendre's D.E. leading to Legendre Polynomials.
Rodrigue's formula

PART – B

UNIT - 5

6 Hours

Statistical Methods

Curve fitting by the method of least squares: $y = a + bx$, $y = a + bx + cx^2$,
 $y = ax^b$, $y = ab^x$, $y = ae^{bx}$, Correlation and Regression.

Probability: Addition rule, Conditional probability, Multiplication rule,
Baye's theorem.

UNIT – 6

7 Hours

Random Variables (Discrete and Continuous) p.d.f., c.d.f. Binomial, Poisson,
Normal and Exponential distributions.

UNIT - 7

7 Hours

Sampling, Sampling distribution, Standard error. Testing of hypothesis for
means. Confidence limits for means, Student's t distribution, Chi-square
distribution as a test of goodness of fit.

UNIT - 8

6 Hours

Concept of joint probability – Joint probability distribution, Discrete and
Independent random variables, Expectation, Covariance, Correlation
coefficient

Probability vectors, Stochastic matrices, Fixed points, Regular stochastic
matrices. Markov chains, Higher transition probabilities. Stationary
distribution of regular Markov chains and absorbing states

Text Book:

1. B.S. Grewal: Higher Engineering Mathematics, 40th Edition,
Khanna Publishers, 2007
(Chapters: 31.1, 31.3 to 31.5, 31.7 to 31.8, 20.1 to 20.20.10, 20.12 to
20.14, 20.16 to 20.19, 16.1 to 16.6, 16.10, 16.13 to 16.14, 24.4 to
24.6, 25.12 to 25.14, 26.1 to 26.6, 26.7 to 26.10, 26.14 to 26.16,
27.1 to 27.6, 27.14, 27.17 to 27.18)
2. Seymour Lipschutz: Probability, Schaum's series, McGraw Hill.
(Chapters: 5 & 7)

Reference Books:

1. B.V. Ramana: Higher Engineering Mathematics, Tata McGraw Hill,
2006.
2. Glyn James: Advanced Modern Engineering Mathematics, 3rd
Edition, Pearson Education, 2003.