Sub Code	**:**	**06MAT41**
IA Marks	**:**	**25**
Hrs/ Week	**:**	**04**
Exam Hours	**:**	

03

Total Hrs.

:

52

Exam Marks

:

100

PART – A

UNIT 1:

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).

6 Hours

UNIT 2:

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: $W = z^2$, $W = e^z$, $W = z + (l/z)$, $z \neq 0$ Bilinear transformations.

7 Hours

UNIT 3:

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).

6 Hours

UNIT 4:

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 fist kind. Equations reducible to Bessel's D.E., Series solution of Legendre's D.E. leading to Legendre Polynomials. Rodirgue's formula.

7 Hours

PART – B

UNIT 5:

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.

6 Hours

UNIT 6:

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

7 Hours

UNIT 7:

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

7 Hours

UNIT 8:

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.

6 Hours

Text Book: Higher Engineering Mathematics by Dr. B.S. Grewal (36th Edition – Khanna Publishers)

Unit No.

Chapter No.

Article Numbers

Page Nos.

I	□□□□□□□□□□□□□

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27.1, 27.3, 27.5, 27.7, 27.8

914, 916 – 922

924, 933

II	□□□□□□□□□□□□

20

20.1 to 20.10

630 – 650

III	□□□□□□□□□□

20

20.12 to 20.14, 20.16 to 20.19

652 – 658

661 – 671

IV	□□□□□□□□□□

16

16.1 to 16.6, 16.10, 16.13, 16.14

507 – 514,

521 – 523

526 – 529

V	□□□□□□□□□□□

1

23

1.12 to 1.14

23.9, 23.10, 23.11, 23.14, 23.16 to 23.18

20 – 25

755 – 762, 765

768 – 776

VI	□□□□□□□□□

23

23.19 to 23.22, 23.26 to 23.30

776 – 780

783 – 798

VII	□□□□□□□□□

23

23.31 to 23.37

791 – 816

Unit – VIII: **Text book: Probability by Seymour Lipschutz** (Schaum's series) Chapters 5 & 7

Reference Books:

1. **Higher Engineering Mathematics** by B.V. Ramana (Tata-Macgraw Hill).

2. **Advanced Modern Engineering Mathematics** by Glyn James – Pearson Education.

Note:

1. One question is to be set from each unit.

2. To answer Five questions choosing atleast Two questions from each part.