Written by Administrator

Saturday, 24 October 2009 05:30 - Last Updated Saturday, 24 October 2009 05:52

ENGINEERING MATHEMATICS - IV

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: $W = z^2$, $W = e^z$, $W = z + (I/z)$, $z \neq 0$ 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.   Confidence 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 | | | III |

27

27.1, 27.3, 27.5, 27.7, 27.8

914, 916 – 922

924, 933

20

20.1 to 20.10

630 – 650

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**☐☐☐   ☐☐☐☐ ☐

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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 |

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| □□□□□□ | VII | □□ | □ |

| 23 |

| 23.31 to 23.37 |

| 791 – 816 |

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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 <u>Five</u> questions choosing   atleast <u>Two</u> questions from each part.