FOR REFERENCE COPY

ENGINEERING MATHEMATICS - II

for the

SECOND SEMESTER B.E. COURSE OF V.T.U

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SUDHA PUBLICATIONS
No.1, Annadanappa Lane, Avenue Road Cross, Bangalore - 560 002

ENGINEERING MATHEMATICS - II
(FOR II SEMESTER) By Dr. K.S. Chandrashekar, M.Sc.,Ph.D.
Published by M/s Sudha Publications, No.1, Annadanappa Lane,
Avenue Road Cross, Bangalore - 560 002

Edition : 2011-12

₹ 300-00

Typeset by : ALLKIND
Flat No.204, Nandish Park Apts., Muthyal Nagar,
Bangalore-54 (M) : 9448294599

Printed at:
SATHYANANDA PRINTERS
12, 4th Cross, Pipeline Road,
Cholurpalya, Bangalore - 560 023.

PREFACE

At the outset I WISH A VERY HAPPY AND PROSPEROUS NEW YEAR to all the esteemed readers. The year 2011 has been my fifteenth year in the field of text book writing without any break. The response graph for my books has maintained upward trend as years have rolled out. I am highly grateful to the community of readers in this regard.

With great pleasure I am writing these few lines on the NEW YEAR day as a preface to the text book ***ENGINEERING MATHEMATICS - II*** *prepared as per the VTU syllabus w.e.f 2010-11. It also caters to the need of autonomous institutions in Karnataka and other technological universities in the country. I believe that the book caters to the need of average as well as above average students.*

Two of my senior colleagues in the department Dr. D Mamta and Ms. G.V Pankaja have dedicatedly carried out the work assigned by me in the preparation of this book. I profusely thank them for executing the assigned task in time.

I am highly thankful to Mr. K.V Balakrishna of M/s Sudha Publications for giving me a free hand in the preparation of books and confidently publishing them with quality.

Meticulous type setting work by Mr. S. Raghunandhan and his colleagues of M/s Allkind is note worthy.

I thank the printers for their co-operation in bringing the book in time.

I eagerly look forward for comments and suggestions. I once again wish every one A HAPPY NEW YEAR - 2011.

January 1st 2011 K.S.Chandrashekar

Mysore - 8

REWARD

VTU students of the current scheme w.e.f 2010-11, scoring 125/125 in all four papers of Engineering Mathematics I to IV Semesters (10 MAT 11, 21, 31, 41) will be rewarded with a cash prize of Rs.7,500/- by the author. Please write to the author directly along with attested xerox copies of marks cards of all the four semesters.

Achiever : ***Mr. Bharath M.V,*** **a student from 2006 batch of E&C branch from PESIT, Bangalore, received cash prize during 2008.**

SYLLABUS

ENGINEERING MATHEMATICS - II

Code : 10 MAT 21
Hrs / week : 04
Total Hrs : 52

IA Marks : 25
Exam Hrs : 03
Exam Marks : 100

PART - A

Unit - I : Differential Equations - 1

Equations of first order and higher degree ($p - y - x$ equations), Equations solvable for p, y, x. General and singular solutions, Clarauit's equation. Applications of differential equations of first order-illustrative examples*. **[6 hours]**

Unit - II : Differential Equation - 2

Linear differential equations : Solution of second and higher order equations with constant coefficients by inverse differential operator method. Siultaneous differential equations of first order. **[7 hours]**

Unit - III : Differential Equations - 3

Method of variation of parameters, Solution of Cauchy's and Legendre's linear equations, Series solution of equations of second order, Frobenius method - simple problems. **[6 hours]**

Unit - IV : Partial Differential Equations (PDE)

Formation of partial differential equations (PDE) by elimination of arbitrary constants & functions. Solution of non-homogeneous PDE by direct integration. Solution of homogeneous PDE involving derivative with respect to one independent variable only. Solution of Lagrange's linear PDE. Solution of PDE by the method of separation of variables (first and second order equations) **[7 hours]**

PART - B

Unit - V : Integral Calculus

Multiple Integrals - Evaluation of double integrals and triple integrals. Evaluation of double integrals over a given region, by change of order of integration, by change of variables. Applications to area and volume - illustrative examples*.

Beta and Gamma Functions - Properties and problems **[6 hours]**

Unit - VI : Vector Integration

Line integrals - definition and problems, surface and volume integrals - definition. Green's theorem in a plane, Stoke's and Gauss divergence theorem (statements only). **[6 hours]**

Unit - VII : Laplace Transfoms - 1

Definition, transforms of elementary functions, properties, periodic function, unit step function and unit implulse function. **[7 hours]**

Unit - VIII : Laplace Transforms - 2

Inverse Laplace Transforms, Convolution theorem, solution of linear differential equations using Laplace transforms. Applications - illustrative examples*. **[7 hours]**

Note : * In the case of illustrative examples, questions are not to be set.

CONTENTS

PART - A

PART - B