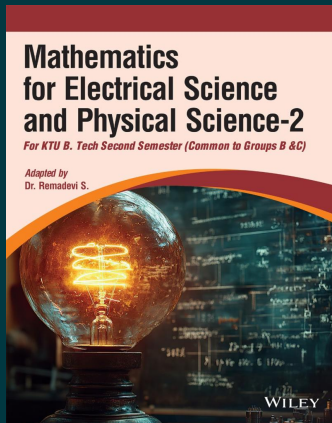




Mathematics for Electrical Science and Physical Science-2 (Common to Groups B & C) For KTU B.Tech Second Semester

By Dr. Remadevi S.

Paperback

9789363865457

[NOT PROVIDED]
publication_date

₹539.00

Pages : 394 pages

Description

This book is a carefully crafted adaptation of the best-selling titles, Advanced Engineering Mathematics, 10th Edition by Erwin Kreyszig, and Calculus: Early Transcendentals, 12th Edition by Howard Anton. Known for its clear expository style and exceptional clarity, this textbook offers a thorough introduction to engineering mathematics and calculus, catering to the evolving needs of modern students in engineering and technical fields. Designed to enhance understanding of key mathematical concepts, it serves as an invaluable resource for students pursuing studies in engineering, mathematics, and related disciplines.

About the Author

Dr. Remadevi S.

Adapted for KTU by

Dr. Remadevi. S

Retd. Professor and Head of Department of Applied Science,
Govt. Model Engineering College,
Thrikkakara, Cochin, Kerala

Table of Contents

MULTIVARIABLE CALCULUS-DIFFERENTIATION

1.1 Limits and Continuity

Limits Along Curves

Open and Closed Sets

General Limits of Functions of Two Variables

Relationships Between General Limits and Limits Along Smooth Curves

Repeated Limits

Algebra of Limits

Continuity

Limits at Discontinuities

Continuity at Boundary Points

Extensions to Three Variables

Solved Examples

Quick Check Problem 1.1

Problem Set 1.1

Answer Key

1.2 Partial Derivatives 21

Partial Derivatives of Functions of Two Variables

The Partial Derivative Functions

Partial Derivative Notation

Partial Derivatives Viewed as Rates of Change and Slopes

Estimating Partial Derivatives from Tabular Data

Implicit Partial Differentiation

Partial Derivatives and Continuity

Sufficient Conditions for Continuity

Partial Derivatives of Functions With More Than Two Variables

Higher-Order Partial Derivatives

Equality of Mixed Partial

Sufficient Condition for the Equality of f_{xy} and f_{yx}

The Wave Equation

Solved Examples

Quick Check Problem 1.2

Problem Set 1.2

Answer Key

1.3 Differentiability, Differentials, and Local Linearity

Differentiability

Differentiability and Continuity

Differentials

Sufficient Conditions for Differentiability

Differentials of Higher Orders

Local Linear Approximations

Solved Examples

Quick Check Problem 1.3

Problem Set 1.3

Answer Key

1.4 The Chain Rule

Chain Rules for Derivatives

Chain Rules for Partial Derivatives

Other Versions of the Chain Rule

Implicit Differentiation

Solved Examples

Quick Check Problem 1.4

Problem Set 1.4

Answer Key

1.5 Maxima and Minima of Functions of Two Variables

Extrema

Bounded Sets

The Extreme-Value Theorem

Finding Relative Extrema

The Second Partial Test

Solved Examples

Quick Check Problem 1.5

Problem Set 1.5

Answer Key

MULTIPLE INTEGRALS

2.1 Double Integrals

Volume

Definition of a Double Integral

Evaluating Double Integrals

Properties of Double Integrals

Solved Examples

Quick Check Problem 2.1

Problem Set 2.1

Answer Key

2.2 Double Integrals Over Nonrectangular Regions

Iterated Integrals with Nonconstant Limits of Integration

Double Integrals Over Nonrectangular Regions

Setting Up Limits of Integration for Evaluating Double Integrals

Reversing the Order of Integration

Area Calculated as a Double Integral

Solved Examples

Quick Check Problem 2.2

Problem Set 2.2

Answer Key

2.3 Double Integrals in Polar Coordinates

Simple Polar Regions

Double Integrals in Polar Coordinates

Evaluating Polar Double Integrals

Finding Areas Using Polar Double Integrals

Converting Double Integrals from Rectangular to Polar Coordinates

Solved Examples

Quick Check Problem 2.3

Problem Set 2.3

Answer Key

2.4 Triple Integrals

Definition of a Triple Integral

Properties of Triple Integrals

Evaluating Triple Integrals Over Rectangular Boxes

Evaluating Triple Integrals Over More General Regions

Volume Calculated as a Triple Integral

Integration in Other Orders

Solved Examples

Quick Check Problem 2.4

Problem Set 2.4

Answer Key

2.5 Triple Integrals in Cylindrical and Spherical Coordinates

Triple Integrals in Cylindrical Coordinates

Converting Triple Integrals from Rectangular to Cylindrical Coordinates

Triple Integrals in Spherical Coordinates

Converting Triple Integrals from Rectangular to Spherical Coordinates

Solved Examples

Quick Check Problem 2.5

Problem Set 2.5

Answer Key

CALCULUS OF VECTOR FUNCTIONS

3.1 Introduction to Vector-Valued Functions

Parametric Curves in 3-space

Parametric Curves Generated with Technology

Parametric Equations for Intersections of Surfaces

Vector-valued Functions

Graphs of Vector-valued Functions

Vector Form of a Line Segment

Solved Examples

Quick Check Problem 3.1

Problem Set 3.1

Answer Key

3.2 Calculus of Vector-valued Functions

Limits and Continuity

Derivatives

Derivative Rules

Tangent Lines to Graphs of Vector-valued Functions

Derivatives of Dot and Cross Products

Definite Integrals of Vector-valued Functions

Rules of Integration

Antiderivatives of Vector-valued Functions

Solved Examples

Quick Check Problem 3.2

Problem Set 3.2

Answer Key

3.3 Directional Derivatives and Gradients

Directional Derivatives

The Gradient

Properties of the Gradient

Gradients Are Normal to Level Curves

An Application of Gradients

Solved Examples

Quick Check Problem 3.3

Problem Set 3.3

Answer Key

3.4 Vector Fields

Graphical Representations of Vector Fields

A Compact Notation for Vector Fields

Inverse-square Fields

Gradient Fields

Conservative Fields and Potential Functions

Divergence and Curl

The ∇ Operator

The Laplacian ∇^2

Solved Examples

Quick Check Problem 3.4

Problem Set 3.4

Answer Key

3.5 Line Integrals

Evaluating Line Integrals

Line Integrals with Respect to x , y , and z

Integrating a Vector Field Along a Curve

Work as a Line Integral

Line Integrals Along Piecewise Smooth Curves

Quick Check Problem 3.5

Problem Set 3.5

Answer Key

3.6 Independence of Path; Conservative Vector Fields

Work Integrals

Independence of Path

The Fundamental Theorem of Line Integrals

Line Integrals Along Closed Paths

A Test for Conservative Vector Fields

Conservative Vector Fields in 3-space

Conservation of Energy

Solved Examples

Quick Check Problem 3.6

Problem Set 3.6

Answer Key

VECTOR INTEGRAL THEOREMS

4.1 Green's Theorem

A Notation for Line Integrals Around Simple Closed Curves

Finding Work Using Green's Theorem

Finding Areas Using Green's Theorem

Green's Theorem for Multiply Connected Regions

Solved Examples

Quick Check Problem 4.1

Problem Set 4.1

Answer Key

4.2 Surface Integrals

Definition of a Surface Integral

Evaluating Surface Integrals

Surface Integrals Over $Z = G(x, Y)$, $Y = G(x, Z)$, and $X = G(y, Z)$

Solved Examples

Quick Check Problem 4.2

Problem Set 4.2

Answer Key

4.3 Applications of Surface Integrals; Flux

Flow Fields

Oriented Surfaces

Orientation of a Smooth Parametric Surface

Flux

Evaluating Flux Integrals

Orientation of Nonparametric Surfaces

Quick Check Problem 4.3

Problem Set 4.3

Answer Key

Orientation of Piecewise Smooth Closed Surfaces

4.4 The Divergence Theorem

Using the Divergence Theorem to Find Flux

Divergence Viewed as Flux Density

Sources and Sinks

Gauss's Law for Inverse-square Fields

Gauss's Law in Electrostatics

Solved Examples

Quick Check Problem 4.4

Problem Set 4.4

Answer Key

4.5 Stoke's Theorem

Relative Orientation of Curves and Surfaces

Stoke's Theorem

Using Stoke's Theorem to Calculate Work

Relationship Between Green's Theorem and Stokes' Theorem

Curl Viewed as Circulation

Solved Examples

Quick Check Problem 4.5

Problem Set 4.5

Answer Key

To purchase this product, please visit:

<https://wiley.indiafin.com/mathematics-for-electrical-science-and-physical-science-2-common-to-groups-b-c-for-ktu-b-tech-second-semester.html>



Scan to buy