

SIGNALS AND SYSTEMS

Analysis Using Transform Methods and MATLAB®

SECOND EDITION

M. J. ROBERTS

$$\delta(t) = 0, \quad t \neq 0$$

$$\int_{t_1}^{t_2} \delta(t) dt = \begin{cases} 1, & t_1 < 0 < t_2 \\ 0, & \text{otherwise} \end{cases}$$

$$u(t) = \begin{cases} 1, & t > 0 \\ 1/2, & t = 0 \\ 0, & t < 0 \end{cases}$$

$$\text{sgn}(t) = \begin{cases} 1, & t > 0 \\ 0, & t = 0 \\ -1, & t < 0 \end{cases}$$

$$\text{ramp}(t) = \begin{cases} t, & t \geq 0 \\ 0, & t < 0 \end{cases}$$

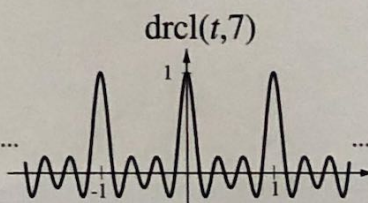
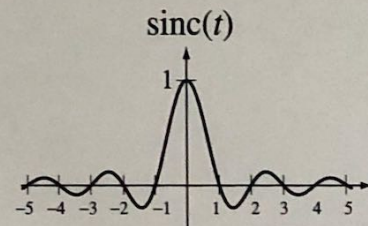
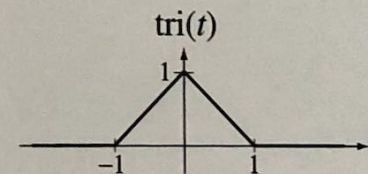
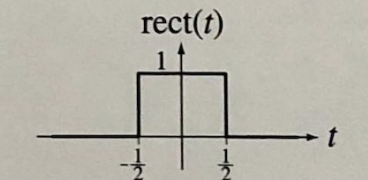
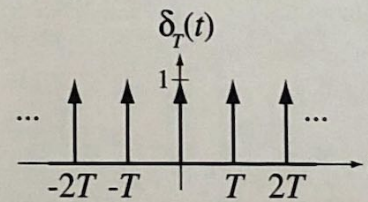
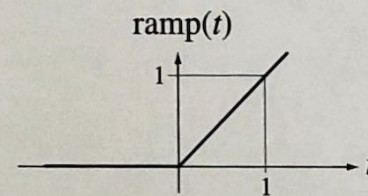
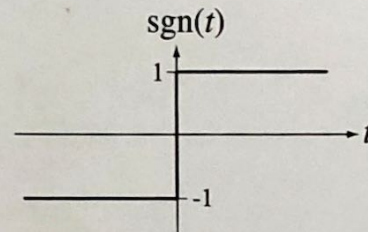
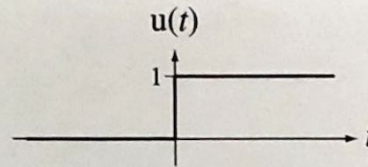
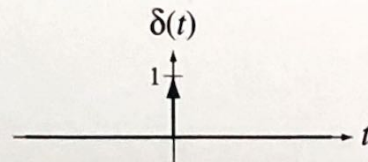
$$\delta_T(t) = \sum_{n=-\infty}^{\infty} \delta(t - nT)$$

$$\text{rect}(t) = \begin{cases} 1, & |t| < 1/2 \\ 1/2, & |t| = 1/2 \\ 0, & |t| > 1/2 \end{cases}$$

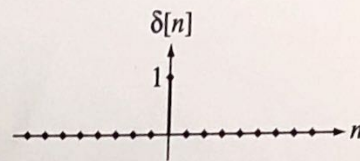
$$\text{tri}(t) = \begin{cases} 1 - |t|, & |t| < 1 \\ 0, & |t| \geq 1 \end{cases}$$

$$\text{sinc}(t) = \frac{\sin(\pi t)}{\pi t}$$

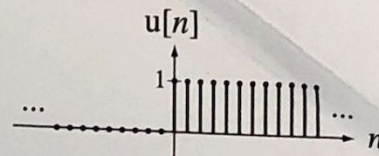
$$\text{drcl}(t, N) = \frac{\sin(\pi N t)}{N \sin(\pi t)}$$



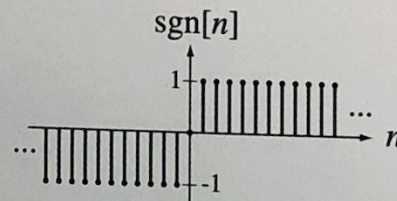
$$\delta[n] = \begin{cases} 1, & n=0 \\ 0, & n \neq 0 \end{cases}$$



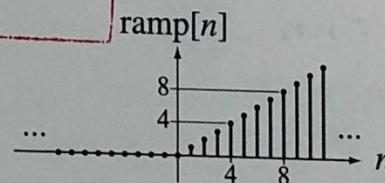
$$u[n] = \begin{cases} 1, & n \geq 0 \\ 0, & n < 0 \end{cases}$$



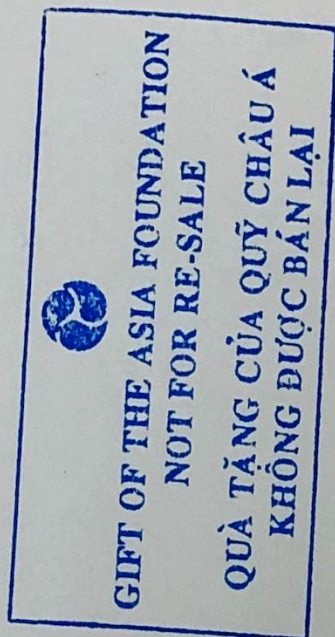
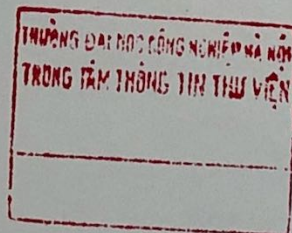
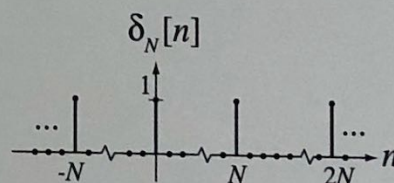
$$\text{sgn}[n] = \begin{cases} 1, & n > 0 \\ 0, & n = 0 \\ -1, & n < 0 \end{cases}$$



$$\text{ramp}[n] = \begin{cases} n, & n \geq 0 \\ 0, & n < 0 \end{cases} = nu[n]$$



$$\delta_N[n] = \sum_{m=-\infty}^{\infty} \delta[n - mN]$$



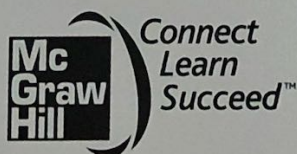
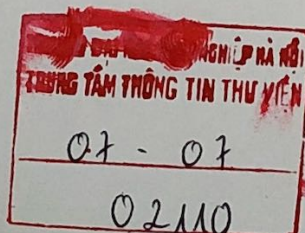
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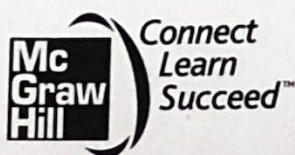
Analysis Using Transform Methods and MATLAB®

Second Edition

Michael J. Roberts

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University of Tennessee*





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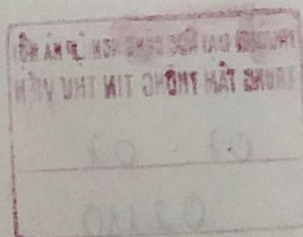
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To my wife Barbara for giving me the time and space to complete this effort
and to the memory of my parents, Bertie Ellen Pinkerton and Jesse Watts Roberts,
for their early emphasis on the importance of education.

Chapter 1	1
Chapter 2	10
Chapter 3	15
Chapter 4	20
Chapter 5	25
Chapter 6	30
Chapter 7	35
Chapter 8	40
Chapter 9	45
Chapter 10	50
Chapter 11	55
Chapter 12	60
Chapter 13	65
Chapter 14	70
Chapter 15	75
Chapter 16	80
Chapter 17	85
Chapter 18	90
Chapter 19	95
Chapter 20	100
Chapter 21	105
Chapter 22	110
Chapter 23	115
Chapter 24	120
Chapter 25	125
Chapter 26	130
Chapter 27	135
Chapter 28	140
Chapter 29	145
Chapter 30	150
Chapter 31	155
Chapter 32	160
Chapter 33	165
Chapter 34	170
Chapter 35	175
Chapter 36	180
Chapter 37	185
Chapter 38	190
Chapter 39	195
Chapter 40	200
Chapter 41	205
Chapter 42	210
Chapter 43	215
Chapter 44	220
Chapter 45	225
Chapter 46	230
Chapter 47	235
Chapter 48	240
Chapter 49	245
Chapter 50	250
Chapter 51	255
Chapter 52	260
Chapter 53	265
Chapter 54	270
Chapter 55	275
Chapter 56	280
Chapter 57	285
Chapter 58	290
Chapter 59	295
Chapter 60	300
Chapter 61	305
Chapter 62	310
Chapter 63	315
Chapter 64	320
Chapter 65	325
Chapter 66	330
Chapter 67	335
Chapter 68	340
Chapter 69	345
Chapter 70	350
Chapter 71	355
Chapter 72	360
Chapter 73	365
Chapter 74	370
Chapter 75	375
Chapter 76	380
Chapter 77	385
Chapter 78	390
Chapter 79	395
Chapter 80	400
Chapter 81	405
Chapter 82	410
Chapter 83	415
Chapter 84	420
Chapter 85	425
Chapter 86	430
Chapter 87	435
Chapter 88	440
Chapter 89	445
Chapter 90	450
Chapter 91	455
Chapter 92	460
Chapter 93	465
Chapter 94	470
Chapter 95	475
Chapter 96	480
Chapter 97	485
Chapter 98	490
Chapter 99	495
Chapter 100	500

CONTENTS

Preface, xii

Chapter 1

Introduction, 1

- 1.1** Signals and Systems Defined, 1
- 1.2** Types of Signals, 3
- 1.3** Examples of Systems, 8
 - A Mechanical System, 9*
 - A Fluid System, 9*
 - A Discrete-Time System, 11*
 - Feedback Systems, 12*
- 1.4** A Familiar Signal and System Example, 14
- 1.5** Use of MATLAB®, 18

Chapter 2

Mathematical Description of Continuous-Time Signals, 19

- 2.1** Introduction and Goals, 19
- 2.2** Functional Notation, 20
- 2.3** Continuous-Time Signal Functions, 20
 - Complex Exponentials and Sinusoids, 21*
 - Functions with Discontinuities, 23*
 - The Signum Function, 24*
 - The Unit-Step Function, 24*
 - The Unit-Ramp Function, 26*
 - The Unit Impulse, 27*
 - The Impulse, the Unit Step and Generalized Derivatives, 29*
 - The Equivalence Property of the Impulse, 30*
 - The Sampling Property of the Impulse, 31*
 - The Scaling Property of the Impulse, 31*
 - The Unit Periodic Impulse or Impulse Train, 32*
 - A Coordinated Notation for Singularity Functions, 33*
 - The Unit-Rectangle Function, 33*
- 2.4** Combinations of Functions, 34
- 2.5** Shifting and Scaling, 36
 - Amplitude Scaling, 36*
 - Time Shifting, 37*

Time Scaling, 39

Simultaneous Shifting and Scaling, 43

- 2.6** Differentiation and Integration, 47
- 2.7** Even and Odd Signals, 49
 - Combinations of Even and Odd Signals, 51*
 - Derivatives and Integrals of Even and Odd Signals, 53*
- 2.8** Periodic Signals, 53
- 2.9** Signal Energy and Power, 56
 - Signal Energy, 56*
 - Signal Power, 57*
- 2.10** Summary of Important Points, 60
- Exercises, 60
 - Exercises with Answers, 60
 - Signal Functions, 60*
 - Scaling and Shifting, 61*
 - Derivatives and Integrals, 65*
 - Even and Odd Signals, 66*
 - Periodic Signals, 68*
 - Signal Energy and Power, 69*
 - Exercises without Answers, 70
 - Signal Functions, 70*
 - Scaling and Shifting, 71*
 - Generalized Derivative, 74*
 - Derivatives and Integrals, 74*
 - Even and Odd Signals, 75*
 - Periodic Signals, 75*
 - Signal Energy and Power, 76*

Chapter 3

Discrete-Time Signal Description, 77

- 3.1** Introduction and Goals, 77
- 3.2** Sampling and Discrete Time, 78
- 3.3** Sinusoids and Exponentials, 80
 - Sinusoids, 80*
 - Exponentials, 83*
- 3.4** Singularity Functions, 84
 - The Unit-Impulse Function, 84*
 - The Unit-Sequence Function, 85*
 - The Signum Function, 85*

The Unit-Ramp Function, 86

The Unit Periodic Impulse Function or Impulse Train, 86

3.5 Shifting and Scaling, 87

Amplitude Scaling, 87

Time Shifting, 87

Time Scaling, 87

Time Compression, 88

Time Expansion, 88

3.6 Differencing and Accumulation, 92

3.7 Even and Odd Signals, 96

Combinations of Even and Odd Signals, 97

Symmetrical Finite Summation of Even and Odd Signals, 97

3.8 Periodic Signals, 98

3.9 Signal Energy and Power, 99

Signal Energy, 99

Signal Power, 100

3.10 Summary of Important Points, 102

Exercises, 102

Exercises with Answers, 102

Signal Functions, 102

Scaling and Shifting, 104

Differencing and Accumulation, 105

Even and Odd Signals, 106

Periodic Signals, 107

Signal Energy and Power, 108

Exercises without Answers, 108

Signal Functions, 108

Shifting and Scaling, 109

Differencing and Accumulation, 111

Even and Odd Signals, 111

Periodic Signals, 112

Signal Energy and Power, 112

Chapter 4

Description of Systems, 113

4.1 Introduction and Goals, 113

4.2 Continuous-Time Systems, 114

System Modeling, 114

Differential Equations, 115

Block Diagrams, 119

System Properties, 122

Introductory Example, 122

Homogeneity, 126

Time Invariance, 127

Additivity, 128

Linearity and Superposition, 129

LTI Systems, 129

Stability, 133

Causality, 134

Memory, 134

Static Nonlinearity, 135

Invertibility, 137

Dynamics of Second-Order Systems, 138

Complex Sinusoid Excitation, 140

4.3 Discrete-Time Systems, 140

System Modeling, 140

Block Diagrams, 140

Difference Equations, 141

System Properties, 147

4.4 Summary of Important Points, 150

Exercises, 151

Exercises with Answers, 151

System Models, 151

System Properties, 153

Exercises without Answers, 155

System Models, 155

System Properties, 157

Chapter 5

Time-Domain System Analysis, 159

5.1 Introduction and Goals, 159

5.2 Continuous Time, 159

Impulse Response, 159

Continuous-Time Convolution, 164

Derivation, 164

Graphical and Analytical Examples of Convolution, 168

Convolution Properties, 173

System Connections, 176

Step Response and Impulse Response, 176

Stability and Impulse Response, 176

Complex Exponential Excitation and the Transfer Function, 177

Frequency Response, 179

5.3 Discrete Time, 181

Impulse Response, 181

Discrete-Time Convolution, 184

Derivation, 184

Graphical and Analytical Examples of Convolution, 187

Convolution Properties, 191
Numerical Convolution, 191
Discrete-Time Numerical Convolution, 191
Continuous-Time Numerical Convolution, 193
Stability and Impulse Response, 195
System Connections, 195
Unit-Sequence Response and Impulse Response, 196
Complex Exponential Excitation and the Transfer Function, 198
Frequency Response, 199

5.4 Summary of Important Points, 201

Exercises, 201

Exercises with Answers, 201

Continuous Time, 201

Impulse Response, 201

Convolution, 201

Stability, 204

Discrete Time, 205

Impulse Response, 205

Convolution, 205

Stability, 208

Exercises without Answers, 208

Continuous Time, 208

Impulse Response, 208

Convolution, 209

Stability, 210

Discrete Time, 212

Impulse Response, 212

Convolution, 212

Stability, 214

Chapter 6

Continuous-Time Fourier Methods, 215

6.1 Introduction and Goals, 215

6.2 The Continuous-Time Fourier Series, 216

Conceptual Basis, 216

Orthogonality and the Harmonic Function, 220

The Compact Trigonometric Fourier Series, 223

Convergence, 225

Continuous Signals, 225

Discontinuous Signals, 226

Minimum Error of Fourier-Series Partial Sums, 228

The Fourier Series of Even and Odd Periodic Functions, 229

Fourier-Series Tables and Properties, 230

Numerical Computation of the Fourier Series, 234

6.3 The Continuous-Time Fourier Transform, 241

Extending the Fourier Series to Aperiodic Signals, 241

The Generalized Fourier Transform, 246

Fourier Transform Properties, 250

Numerical Computation of the Fourier Transform, 259

6.4 Summary of Important Points, 267

Exercises, 267

Exercises with Answers, 267

Fourier Series, 267

Orthogonality, 268

CTFS Harmonic Functions, 268

System Response to Periodic Excitation, 271

Forward and Inverse Fourier Transforms, 271

Relation of CTFS to CTFT, 280

Numerical CTFT, 281

System Response, 282

Exercises without Answers, 282

Fourier Series, 282

Orthogonality, 283

Forward and Inverse Fourier Transforms, 283

Chapter 7

Discrete-Time Fourier Methods, 290

7.1 Introduction and Goals, 290

7.2 The Discrete-Time Fourier Series and the Discrete Fourier Transform, 290

Linearity and Complex-Exponential Excitation, 290

Orthogonality and the Harmonic Function, 294

Discrete Fourier Transform Properties, 298

The Fast Fourier Transform, 302

7.3 The Discrete-Time Fourier Transform, 304

Extending the Discrete Fourier Transform to Aperiodic Signals, 304

Derivation and Definition, 305

The Generalized DTFT, 307

Convergence of the Discrete-Time Fourier Transform, 308

DTFT Properties, 309

Numerical Computation of the Discrete-Time Fourier Transform, 315

7.4 Fourier Method Comparisons, 321

7.5 Summary of Important Points, 323

Exercises, 323

Exercises with Answers, 323

Orthogonality, 323

Discrete Fourier Transform, 324

Discrete-Time Fourier Transform Definition, 324
Forward and Inverse Discrete-Time Fourier Transforms, 325

Exercises without Answers, 328

Discrete Fourier Transform, 328

Forward and Inverse Discrete-Time Fourier Transforms, 328

Chapter 8

The Laplace Transform, 331

8.1 Introduction and Goals, 331

8.2 Development of the Laplace Transform, 332
Generalizing the Fourier Transform, 332
Complex Exponential Excitation and Response, 334

8.3 The Transfer Function, 335

8.4 Cascade-Connected Systems, 335

8.5 Direct Form II Realization, 336

8.6 The Inverse Laplace Transform, 337

8.7 Existence of the Laplace Transform, 337
Time-Limited Signals, 338
Right- and Left-Sided Signals, 338

8.8 Laplace Transform Pairs, 339

8.9 Partial-Fraction Expansion, 344

8.10 Laplace Transform Properties, 354

8.11 The Unilateral Laplace Transform, 356
Definition, 356
Properties Unique to the Unilateral Laplace Transform, 358
Solution of Differential Equations with Initial Conditions, 360

8.12 Pole-Zero Diagrams and Frequency Response, 362

8.13 MATLAB System Objects, 370

8.14 Summary of Important Points, 372

Exercises, 372

Exercises with Answers, 372

Laplace Transform Definition, 372

Existence of the Laplace Transform, 373

Direct Form II System Realization, 373

Forward and Inverse Laplace Transforms, 373

Unilateral Laplace Transform Integral, 375

Solving Differential Equations, 376

Pole-Zero Diagrams and Frequency Response, 377

Exercises without Answers, 378

Laplace Transform Definition, 378

Existence of the Laplace Transform, 378

Direct Form II System Realization, 378

Forward and Inverse Laplace Transforms, 378

Solution of Differential Equations, 379

Pole-Zero Diagrams and Frequency Response, 380

Chapter 9

The z Transform, 382

9.1 Introduction and Goals, 382

9.2 Generalizing the Discrete-Time Fourier Transform, 383

9.3 Complex Exponential Excitation and Response, 384

9.4 The Transfer Function, 384

9.5 Cascade-Connected Systems, 384

9.6 Direct Form II System Realization, 385

9.7 The Inverse z Transform, 386

9.8 Existence of the z Transform, 386
Time-Limited Signals, 386
Right- and Left-Sided Signals, 387

9.9 z -Transform Pairs, 389

9.10 z -Transform Properties, 392

9.11 Inverse z -Transform Methods, 393
Synthetic Division, 393
Partial-Fraction Expansion, 394
Examples of Forward and Inverse z Transforms, 394

9.12 The Unilateral z Transform, 399
Properties Unique to the Unilateral z Transform, 399
Solution of Difference Equations, 400

9.13 Pole-Zero Diagrams and Frequency Response, 401

9.14 MATLAB System Objects, 404

9.15 Transform Method Comparisons, 406

9.16 Summary of Important Points, 410

Exercises, 411

Exercises with Answers, 411

Direct Form II System Realization, 411

Existence of the z Transform, 411

Forward and Inverse z Transforms, 411

Unilateral z -Transform Properties, 413

Solution of Difference Equations, 414

Pole-Zero Diagrams and Frequency Response, 415

Exercises without Answers, 416

Direct Form II System Realization, 416

Existence of the z Transform, 416

Forward and Inverse z Transforms, 416
Pole-Zero Diagrams and Frequency Response, 417

Chapter 10

Sampling and Signal Processing, 420

10.1 Introduction and Goals, 420

10.2 Continuous-Time Sampling, 421

Sampling Methods, 421

The Sampling Theorem, 423

Qualitative Concepts, 423

Sampling Theorem Derivation, 425

Aliasing, 428

Time-Limited and Bandlimited Signals, 431

Interpolation, 432

Ideal Interpolation, 432

Practical Interpolation, 433

Zero-Order Hold, 434

First-Order Hold, 434

Sampling Bandpass Signals, 435

Sampling a Sinusoid, 438

Band-Limited Periodic Signals, 441

Signal Processing Using the DFT, 444

CTFT-DFT Relationship, 444

CTFT-DTFT Relationship, 445

Sampling and Periodic-Repetition Relationship, 448

Computing the CTFS Harmonic Function with the DFT, 452

Approximating the CTFT with the DFT, 452

Forward CTFT, 452

Inverse CTFT, 453

Approximating the DTFT with the DFT, 453

Approximating Continuous-Time Convolution with the DFT, 453

Aperiodic Convolution, 453

Periodic Convolution, 453

Discrete-Time Convolution with the DFT, 453

Aperiodic Convolution, 453

Periodic Convolution, 453

Summary of Signal Processing Using the DFT, 454

10.3 Discrete-Time Sampling, 455

Periodic-Impulse Sampling, 455

Interpolation, 457

10.4 Summary of Important Points, 460

Exercises, 461

Exercises with Answers, 461

Pulse Amplitude Modulation, 461

Sampling, 461

Impulse Sampling, 462

Nyquist Rates, 465

Time-Limited and Bandlimited Signals, 465

Interpolation, 466

Aliasing, 467

Bandlimited Periodic Signals, 468

CTFT-CTFS-DFT Relationships, 468

Windows, 470

DFT, 471

Exercises without Answers, 475

Sampling, 475

Impulse Sampling, 476

Nyquist Rates, 477

Aliasing, 477

Practical Sampling, 477

Bandlimited Periodic Signals, 478

DFT, 478

Chapter 11

Frequency Response Analysis, 481

11.1 Introduction and Goals, 481

11.2 Frequency Response, 481

11.3 Continuous-Time Filters, 482

Examples of Filters, 482

Ideal Filters, 487

Distortion, 487

Filter Classifications, 488

Ideal Filter Frequency Responses, 488

Impulse Responses and Causality, 489

The Power Spectrum, 492

Noise Removal, 492

Bode Diagrams, 493

The Decibel, 493

The One-Real-Pole System, 497

The One-Real-Zero System, 498

Integrators and Differentiators, 499

Frequency-Independent Gain, 499

Complex Pole and Zero Pairs, 502

Practical Filters, 504

Passive Filters, 504

The Lowpass Filter, 504

The Bandpass Filter, 507

Active Filters, 508

Operational Amplifiers, 509

The Integrator, 510

The Lowpass Filter, 510

11.4 Discrete-Time Filters, 518

Notation, 518

Ideal Filters, 519

Distortion, 519

Filter Classifications, 520

Frequency Responses, 520

Impulse Responses and Causality, 520

Filtering Images, 521

Practical Filters, 526

Comparison with Continuous-Time Filters, 526

Highpass, Bandpass and Bandstop Filters, 528

The Moving Average Filter, 532

The Almost Ideal Lowpass Filter, 536

Advantages Compared to Continuous-Time Filters, 538

11.5 Summary of Important Points, 538

Exercises, 539

Exercises with Answers, 539

Continuous-Time Frequency Response, 539

Continuous-Time Ideal Filters, 539

Continuous-Time Causality, 540

Logarithmic Graphs and Bode Diagrams, 540

Continuous-Time Practical Passive Filters, 541

Continuous-Time Practical Active Filters, 544

Discrete-Time Frequency Response, 545

Discrete-Time Ideal Filters, 546

Discrete-Time Causality, 546

Discrete-Time Practical Filters, 546

Exercises without Answers, 547

Continuous-Time Frequency Response, 547

Continuous-Time Ideal Filters, 547

Continuous-Time Causality, 548

Bode Diagrams, 548

Continuous-Time Practical Passive Filters, 549

Continuous-Time Filters, 551

Continuous-Time Practical Active Filters, 551

Discrete-Time Causality, 554

Discrete-Time Filters, 554

Image Filtering, 557

Chapter 12

Communication System Analysis, 558

12.1 Introduction and Goals, 558

12.2 Continuous Time Communication Systems, 558

Need for Communication Systems, 558

Frequency Multiplexing, 560

Analog Modulation and Demodulation, 561

Amplitude Modulation, 561

Double-Sideband Suppressed-Carrier Modulation, 561

Double-Sideband Transmitted-Carrier Modulation, 564

Single-Sideband Suppressed-Carrier Modulation, 566

Angle Modulation, 567

12.3 Discrete-Time Sinusoidal-Carrier Amplitude Modulation, 576

12.4 Summary of Important Points, 578

Exercises, 578

Exercises with Answers, 578

Amplitude Modulation, 578

Angle Modulation, 580

Exercises without Answers, 582

Amplitude Modulation, 582

Angle Modulation, 583

Envelope Detector, 583

Chopper-Stabilized Amplifier, 584

Multipath, 585

Chapter 13

Laplace System Analysis, 586

13.1 Introduction and Goals, 586

13.2 System Representations, 586

13.3 System Stability, 590

13.4 System Connections, 593

Cascade and Parallel Connections, 593

The Feedback Connection, 593

Terminology and Basic Relationships, 593

Feedback Effects on Stability, 594

Beneficial Effects of Feedback, 595

Instability Caused by Feedback, 598

Stable Oscillation Using Feedback, 602

The Root-Locus Method, 606

Tracking Errors in Unity-Gain Feedback Systems, 612

- 13.5** System Analysis Using MATLAB, 615
- 13.6** System Responses to Standard Signals, 617
 - Unit-Step Response*, 618
 - Sinusoid Response*, 621
- 13.7** Standard Realizations of Systems, 624
 - Cascade Realization*, 624
 - Parallel Realization*, 626
- 13.8** Summary of Important Points, 626
- Exercises, 627
 - Exercises with Answers, 627
 - Transfer Functions*, 627
 - Stability*, 628
 - Parallel, Cascade and Feedback Connections*, 629
 - Root Locus*, 631
 - Tracking Errors in Unity-Gain Feedback Systems*, 632
 - Response to Standard Signals*, 632
 - System Realization*, 633
 - Exercises without Answers, 634
 - Transfer Functions*, 634
 - Stability*, 634
 - Parallel, Cascade and Feedback Connections*, 634
 - Root Locus*, 638
 - Tracking Errors in Unity-Gain Feedback Systems*, 639
 - Responses to Standard Signals*, 639
 - System Realization*, 640

Chapter 14

z-Transform System Analysis, 641

- 14.1** Introduction and Goals, 641
- 14.2** System Models, 641
 - Difference Equations*, 641
 - Block Diagrams*, 642
- 14.3** System Stability, 642
- 14.4** System Connections, 643
- 14.5** System Responses to Standard Signals, 645
 - Unit-Sequence Response*, 645
 - Response to a Causal Sinusoid*, 648
- 14.6** Simulating Continuous-Time Systems with Discrete-Time Systems, 651
 - z-Transform-Laplace-Transform Relationships*, 651
 - Impulse Invariance*, 653
 - Sampled-Data Systems*, 655
- 14.7** Standard Realizations of Systems, 661
 - Cascade Realization*, 661
 - Parallel Realization*, 661

- 14.8** Summary of Important Points, 662
- Exercises, 663

Exercises with Answers, 663

- Stability*, 663
- Parallel, Cascade and Feedback Connections*, 663
- Response to Standard Signals*, 663
- Root Locus*, 664
- Laplace-Transform-z-Transform Relationship*, 665
- Sampled-Data Systems*, 665
- System Realization*, 665

Exercises without Answers, 666

- Stability*, 666
- Parallel, Cascade and Feedback Connections*, 666
- Response to Standard Signals*, 667
- Laplace-Transform-z-Transform Relationship*, 668
- Sampled-Data Systems*, 668
- System Realization*, 668
- General*, 669

Chapter 15

Filter Analysis and Design, 670

- 15.1** Introduction and Goals, 670
- 15.2** Analog Filters, 670
 - Butterworth Filters*, 671
 - Normalized Butterworth Filters*, 671
 - Filter Transformations*, 672
 - MATLAB Design Tools*, 674
 - Chebyshev, Elliptic and Bessel Filters*, 676
- 15.3** Digital Filters, 679
 - Simulation of Analog Filters*, 679
 - Filter Design Techniques*, 679
 - IIR Filter Design*, 679
 - Time-Domain Methods*, 679
 - Impulse-Invariant Design*, 679
 - Step-Invariant Design*, 686
 - Finite-Difference Design*, 688
 - Frequency-Domain Methods*, 694
 - Direct Substitution and the Matched z-Transform*, 694
 - The Bilinear Method*, 696
 - FIR Filter Design*, 703
 - Truncated Ideal Impulse Response*, 703
 - Optimal FIR Filter Design*, 713
 - MATLAB Design Tools*, 715
- 15.4** Summary of Important Points, 717

Exercises, 717**Exercises with Answers, 717***Continuous-Time Butterworth Filters, 717**Impulse-Invariant and Step-Invariant Filter Design, 719**Finite-Difference Filter Design, 720**Matched z -Transform and Direct Substitution
Filter Design, 720**Bilinear z -Transform Filter Design, 721**FIR Filter Design, 721***Exercises without Answers, 723***Analog Filter Design, 723**Impulse-Invariant and Step-Invariant Filter
Design, 724**Finite-Difference Filter Design, 724**Matched z -Transform and Direct Substitution Filter
Design, 724**Bilinear z -Transform Filter Design, 725**FIR Filter Design, 725***Chapter 16****State-Space Analysis, 726****16.1 Introduction and Goals, 726****16.2 Continuous-Time Systems, 726***System and Output Equations, 727**Transfer Functions, 738**Alternate State-Variable Choices, 740**Transformations of State Variables, 741**Diagonalization, 742**MATLAB Tools for State-Space Analysis, 745***16.3 Discrete-Time Systems, 746***System and Output Equations, 746**Transfer Functions and Transformations of State
Variables, 750**MATLAB Tools for State-Space Analysis, 753***16.4 Summary of Important Points, 753****Exercises, 754****Exercises with Answers, 754***Continuous-Time State Equations, 754**Continuous-Time System Response, 756**Diagonalization, 756**Differential-Equation Description, 757**Discrete-Time State Equations, 757**Difference-Equation Description, 758**Discrete-Time System Response, 758***Exercises without Answers, 759***Continuous-Time State Equations, 759**Continuous-Time System Response, 759**Discrete-Time State Equations, 759**Discrete-Time System Response, 760**Diagonalization, 760***Appendix A****Useful Mathematical
Relations, 761****B****Continuous-Time Fourier Series
Pairs, 764****C****Discrete Fourier Transform
Pairs, 767****D****Continuous-Time Fourier Transform
Pairs, 770****E****Discrete-Time Fourier Transform
Pairs, 777****F****Tables of Laplace Transform
Pairs, 782****G** **z Transform Pairs, 784****Bibliography, 786****Index, 788**