629.8 GUP

CONTENT

		Page
1.	The Problem and the Method of Attack	1
	1.1 The Plant	2
	1.2 The control Problem and the Basic Approach	5
	1.3 A Special Case of Interest : The Sampled-Data System	10
	1.4 The State Variable Approach – A Broadening of the Basic Asssumptions	11
	1.5 The Method of Analysis	13
2.	Continuous – Time systems and their Response	15
	2.1 Introduction	16
	2.2 The Impulse-Response and Transfer Functions of a Linear Time-Invariant system	16
	2.3 Transient Analysis By Use of the Transfer Functions	31
	Problems	45
3.	Analysis of Continuous-Time Systems	51
	3.1 Introduction	52
	3.2 Stability	53
	3.3 The Steady-State Error constants : K_p, K_v, and K_a	82
	3.4 Frequency-Response Methods	92
	Problems	112
4.	More on the Analysis of Continuous –Time Systems	121
	4.1 Introduction	122
	4.2 Root Locus Method	122
	4.3 Mitrovic's Method	149
	Problems	160
5.	Discrete-Time Systems and Their Response	163
	5.1 Introduction	164
	5.2 Development of Basic Z-Transform and Concept of Transfer Functions in the z-Domain	164
	5.3 The Basic Process of Sampling and the use of Hold Circuits	179
	5.4 Transient Analysis by use of Transfer Functions	184
	Problems	199
6.	Analysis of Discrete-time Systems	203
	6.1 Introduction	204
	6.2 Stability	204
	6.3 Error Constants K_p, K_v, and K_a	217
	6.4 Frequency-Response Methods	222
	6.5 Root Locus Method	228
	6.6 Mitrovic's Method	238
	Problems	243
7.	Analysis by state Variable Methods	247
	7.1 Introduction	248
	7.2 Continuous-Time Systems	249
	7.3 Discrete-Time Systems	286
	Problems	305
8.	Classical Compensation of continuous-Time Control Systems	309
	8.1 Introduction to Cascade Compensation	310

8.2 Realization of Common Compensators 321
8.3 Root Locus Compensation 326
8.4 Frequency-Response compensation 353
8.5 Compensation by Mitrovic's Method 378
8.6 Design of Compensators by s-Plane Synthesis 397
8.7 A comparison of the Various Methods of compensation 414
Problems 418

9. Classical Compensation of Discrete-Time Control Systems 425
9.1 Introduction 426
9.2 Forward-Path Continuous Compensation 429
9.3 Forward-Path Digital Compensation 438
9.4 Design of Compensators by z-Plane Synthesis 446
9.5 Compensation for Deadbeaty Performance 456
9.6 Compensation by Mitrovic's Method 461
Problems 468

10. State Variable Feedback Compensation 473
10.1 Introduction 474
10.2 State Variable Feedback Compensation of Continuous-Time Systems 474
10.3 State-Variable Feedback Compensation of Discrete-Time Systems 505
Problems 518

11. Integral-Square Error Compensation 523
11.1 Introduction 524
11.2 Basic Tools 526
11.3 Parameter Optimization using Integral Square Error Criterion 538
11.4 Compensator Design without Constraints 543
11.5 Compensator Design subject to Constraints 553
11.6 Some Comments on the Design of Compensators for Diecrete-Time Systems Using Sum Square Error Criterion 564
Problems 564

Selected Bibliography 573
Index 579