List of Tables:

Table Numb	er	Title	Page	
Table (2.1) PID controller parameters in the Ziegler-Nichols step response				
method			12	
Table (2.2)	PID controller	parameters in the	he Ziegler-Nichols frequency	
response met	thod		12	
Table (2.3) 1	PID controller p	arameters accordi	ng to Cohen-Coon method .13	
Table (5. 1) Comparison of the system responses with missing packets69				

List of Figures:

Figure Number	Title	Page
Figure (2. 1)	Typical PID response	10
Figure (2. 2)	Determining the process parameters	s in the Ziegler-Nichols
step response me	ethod	11
Figure (2. 3)	The NCS Model	16
Figure (2. 4)	Hierarchical Structure	17
Figure (2. 5)	Direct Structure	18
Figure (2. 6)	A Network Hierarchy	20
Figure (2. 7)	Token Bus Topology	23
Figure (2. 8)	Delays in Networked Control Syste	m26
Figure (2. 9)	Time Components in a Source Node	e to Destination Node
Delay		28
Figure (3. 1)	Position Control System	33
Figure (3. 2 - a)	Time Constant	34
Figure (3. 2 - b)	Integrator	34
Figure (3. 3)	Servo-System Response	38
Figure (3. 4)	Block Diagram of the system with	a PID controller39
Figure (3. 5)	Practical PID arrangements	39
Figure (3. 6)	Practical PID response	40
Figure (4. 1)	Digitization Process	43
Figure (4. 2)	Bode Plot of the plant	45
Figure (4. 3)	Discrete System Response with (T	= 0.005) seconds47
Figure (4. 4)	System Components for Optimizat	ion48
Figure (4. 5)	Steepest Descent Gradient Method	Curve50
Figure (4. 6)	System response with new controlle	r parameters54
Figure (4. 7)	System response with tuned controll	er parameters55

Figure (5. 1)	Networked Model of the given System57
Figure (5. 2)	The Ethernet Frame/Packet format59
Figure (5. 3)	System Response with e(k-2) when e(k) is missing63
Figure (5. 4)	System response with e(k-1) missing and previous PID
parameters val	ues65
Figure (5. 5)	System response with missing e(k-1) and new parameters.66