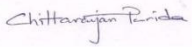
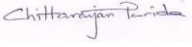




UTKALINSTITUTE OF ENGINEERING & TECHNOLOGY

DISCIPLINE: electrical engineering	SEMESTER: 6TH Sem	NAME OF THE TEACHING FACULTY: Engg PRIYADARSHINI PARIDA		
SUBJECT: Th3. CONTROL SYSTEM ENGINEERING	No of Days/Per week class allotted: 5 ClassP/W(60)	Semester From Date: 16/01/2024 To Date: 26/04/ 2024 No. Of Weeks: 12		
WEEK	CLASS DAY	THEORY TOPICS <u>PART-A FUNDAMENTAL OF CONTROL SYSTEM</u>	REMARKS	
1 st	1 st	Classification of Control system	Date	Dean/Principal
	2 nd	Open loop system & Closed loop system and its comparison		
	3 rd	Effect of Feed back		
	4 th	Standard test Signals (Step, Ramp, Parabolic, Impulse Functions) and Servo mechanism		
	5 th	<u>PART B MATHEMATICAL MODEL OF A SYSTEM:</u> Transfer Function & Impulse response		
2 nd	1 st	Properties, Advantages & Disadvantages of Transfer Function		
	2 nd	Poles & Zeros of transfer Function and Simple problems of transfer function of network.		
	3 rd	Mathematical modeling of Electrical Systems (R, L, C, Analogous systems)		
	4 th	<u>PART C CONTROL SYSTEM COMPONENTS:</u> Components of Control System		
	5 th	Components of Control System		
3 rd	1 st	Gyroscope, Synchros, Tachometer, DC servomotors, AC servomotors.		
	2 nd	Gyroscope, Synchros, Tachometer, DC servomotors, AC servomotors.		
	3 rd	<u>PART D BLOCK DIAGRAM ALGEBRA & SIGNAL FLOW GRAPHS:</u> Definition: Basic Elements of Block Diagram		
	4 th	Canonical Form of Closed loop Systems and Rules for Block diagram reduction		
	5 th	Procedure for reduction of Block Diagram		
4 th	1 st	Simple Problem for equivalent transfer function		
	2 nd	Basic Definition in Signal Flow Graph & properties		
	3 rd	Construction of Signal Flow graph from Block diagram		
	4 th	Mason's Gain formula		
	5 th	Simple problems in Signal flow graph for network		
5 th	1 st	<u>PART E TIME RESPONSE ANALYSIS:</u> Time response of control system.		

	2 nd	Standard Test signal.		
	3 rd	Time Response of first order system with: 1. Unit step response 2. Unit impulse response		
	4 th	Time response of second order system to the unit step input.		
	5 th	Types of control system. [Steady state errors in Type-0, Type-1, Type-2 system]		
	6 th	Types of control system. [Steady state errors in Type-0, Type-1, Type-2 system]		
	1 st	Types of control system. [Steady state errors in Type-0, Type-1, Type-2 system]		
	2 nd	Effect of adding poles and zero to transfer function.		
	3 rd	Effect of adding poles and zero to transfer function.		
	4 th	7 Response with P, PI, PD and PID controller.		
	5 th	8 Response with P, PI, PD and PID controller.		
7 th	1 st	<u>PART ANALYSIS OF STABILITY BY ROOT LOCUS TECHNIQUE.</u> Root locus concept.		
	2 nd	Root locus concept.		
	3 rd	Root locus concept.		
	4 th	Construction of root loci.		
	5 th	Construction of root loci.		
8 th	1 st	Rules for construction of the root locus.		
	2 nd	Rules for construction of the root locus.		
	3 rd	Effect of adding poles and zero to $G(s)$ and $H(s)$.		
	4 th	Effect of adding poles and zero to $G(s)$ and $H(s)$.		
	5 th	Effect of adding poles and zero to $G(s)$ and $H(s)$.		
9 th	1 st	<u>PART OF FREQUENCY RESPONSE ANALYSIS.</u> Correlation between time response and frequency response		
	2 nd	Correlation between time response and frequency response		
	3 rd	Correlation between time response and frequency response		
	4 th	Polar plots.		
	5 th	Bode plots.		
10 th	1 st	All pass and minimum phase system.		
	2 nd	Computation of Gain margin and phase margin.		
	3 rd	Log magnitude versus phase plot.		
	4 th	Log magnitude versus phase plot.		

	5 th	Closed loop frequency response.		
11 th	1 st	<u>PARTH NYQUIST PLOT:</u> Principle of argument		
	2 nd	Principle of argument		
	3 rd	Nyquist stability criterion.		
	4 th	Nyquist stability criterion.		
	5 th	Nyquist stability criterion applied to inverse polar plot		
12 th	1 st	4 Effect of addition of poles and zeros to $G(S)H(S)$ on the shape of Nyquist plot		
	2 nd	5 Effect of addition of poles and zeros to $G(S)H(S)$ on the shape of Nyquist plot		
	3 rd	Assessment of relative stability.		
	4 th	Constant M and N circle		
	5 th	Nichols chart.		
HOD 		DEAN 	PRINCIPAL 