Badriprasad Institute of Technology, Sambalpur

Lesson plan for Theory -3,Control System Engineering

Semester & Branch : 6th Sem, Electrical Engineering **Total Periods-75**

Name of the faculty : Umesh Ch. Prusty **No of periods /week-5**

WEEK	CLASS DAY	THEORY
1ST	1ST	classification of control system
	2ND	open loop and closed loop system(comparison)
	3RD	effect of feedback
	4TH	standard test signals
	5TH	servo mechanism
2ND	1ST	transfer function & impulse response
	2ND	properties,advantage and disadvantage of transfer function
	3RD	poles and zeroes of transfer function.
	4TH	numericals of transfer function of network
	5TH	mathematical modelling of electrical system
3RD	1ST	1st class test of mathematical model of a system
	2ND	components of control system
	3RD	gyroscope,synchros
	4TH	Tachometer,DC and AC servomotors.
	5TH	Basic elements of block diagram
4TH	1ST	canonical form of closed loop system.
	2ND	rules for block diagram reduction.
	3RD	procedure for reduction of block diagram
	4TH	numericals for equivalent transfer function
	5TH	definition in signal flow graph and properties
5TH	1ST	construction of signal flow graph
	2ND	mason's gain formula.
	3RD	numericals in signal flow graph for network
	4TH	time response of control system
	5TH	standard test signals(step and ramp signal)
6TH	1ST	standard test signals(parabolic and impulse signals)
	2ND	time response of 1st order system(unit step)
	3RD	time response of 1st order system(unit impulse)
	4TH	time response of 2nd order system.
	5TH	time response specification
7TH	1ST	expression for rise time,peak time,settling time etc
	2ND	steady state error and error constant
	3RD	types of control system
	4TH	effect of adding poles and zeros to transfer function.
	5TH	response with P,PI,PD and PID controller.
8TH	1ST	2nd class test of time response analysis.
	2ND	root locus concept
	3RD	construction of root loci
	4TH	rules for construction of root locus.
	5TH	effect of adding poles and zeros to G(s)&H(s).
9TH	1ST	correlation between time response and frequency response
	2ND	polar plots
	3RD	bode plots
	4TH	all pass and minimum phase system.
	5TH	commutation of gain margin and phase margin

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10TH	1ST	log magnitude vs phase plot
	2ND	closed loop frequency response.
	3RD	3rd class test of frequency response analysis.
	4TH	doubt solving class of time and frequency response
	5TH	principle of argument.
11TH	1ST	nyquist stability criterion
	2ND	application to inverse polar plot.
	3RD	effect of addition of poles and zeros on nyquist plot.
	4TH	assessment of relative stability
	5TH	constant M and N circuit.
12TH	1ST	Nicholas chart.
	2ND	doubt solving classes of control system components
	3RD	doubt solving classes of signal flow graph.
	4TH	mock practice test in semester pattern(80 marks)
	5TH	mock practice test in semester pattern(80 marks)
13TH	1ST	revision of block diagram algebra
	2ND	revision of block diagram algebra
	3RD	revision of step signal
	4TH	revision of ramp signal
	5TH	revision of parabolic signal
14TH	1ST	revision of open loop and closed loop system
	2ND	revision of servo mechanism
	3RD	revision of mason's gain formula
	4TH	revision of root locus technique.
	5TH	revision of frequency response analysis
15TH	1ST	numericals related to frequency response analysis
	2ND	revision on nyquist plot
	3RD	doubt solving class of time and frequency response
	4TH	objective type question discussions
	5TH	objective type question discussions

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