

Discipline: - Electrical	Semester: - 6th	NameOftheTeachingFaculty: -Amarendra Behera
Subject: - Control System Engineering	No Of Days Per weekClass Allotted: -5	NoOfWeeks: -12 Start Date- End Date-
No.of week	No.of class	Topic to be taught
1 st	1	Fundamental of control system
	2	Classificationof Controlsystem, Open loop system & Closed loop system and its comparison
	3	Effects ofFeedback
	4	StandardtestSignals (Step,Ramp,Parabolic, Impulse Functions)
	5	Servomechanism
2 nd	6	TransferFunction&Impulseresponse
	7	Properties,Advantages&Disadvantagesof Transfer Function
	8	Poles & Zeroes oftransferFunction
	9	Simpleproblems oftransferfunctionofnetwork
	10	Mathematical modeling (R, L, C, Analogous systems)
3 rd	11	Components of ControlSystem
	12	Gyroscope,Synchro's,
	13	Tachometer
	14	DCservomotors, AcServomotors
	15	Definition:BasicElementsofBlockDiagram
4 th	16	Canonical Form ofClosedloop Systems
	17	RulesforBlockdiagramreduction
	18	ProcedureforofReductionof Block Diagram
	19	SimpleProblemforequivalenttransferfunction
	20	BasicDefinitioninSignalFlowGraph&properties
5 th	21	ConstructionofSignalFlowgraphfromBlock diagram
	22	Mason 'sGainformula,problemsinSignalflowgraphfornetwork
	24	StepSignal,RampSignal, Parabolic Signal, Impulse Signal
	25	TimeResponseoffirstordersystemwith: Unit step input.
6 th	26	TimeResponseoffirst ordersystemwith Unit impulse response
	27	Timeresponseofsecondordersystemtotheunit step input. Timeresponsespecification
	28	Derivation of expression for rise time, peak time, peakovershoot, settlingtime andsteadystate error
	29	Steady stateerroranderrorconstants
	30	Types of control system(Steadystate errorsin Type-0,1 and 2)
7 th	31	Effectofadding polesandzeroto transfer function
	32	Response withP,PI,PDand PIDcontroller
	33	Rootlocusconcept
	34	Construction ofrootloci

	35	Construction of root loci
8th	36	Construction of root loci
	37	Rules for construction of the root locus
	38	Rules for construction of the root locus
	39	Simple Problems Regarding construction of Root Locus
	40	Simple Problems Regarding construction of Root Locus
9th	41	Simple Problems Regarding construction of Root locus.
	42	Effect of adding poles and zeros to $G(s)$ and $H(s)$
	43	Correlation between time response and frequency response
	44	Polar plots
	45	Polar plots
10th	46	Bode plots
	47	Bode plots
	48	All pass and minimum phase system
	49	Computation of Gain margin and phase margin
	50	Computation of Gain margin and phase margin
11th	51	Log magnitude versus phase plot
	52	Closed loop frequency response
	53	Principle of argument
	54	Nyquist stability criterion
	55	Nyquist stability criterion applied to inverse polar plot
12th	56	Effect of addition of poles and zeros to $G(S)H(S)$ on the shape of Nyquist plot
	57	Effect of addition of poles and zeros to $G(S)H(S)$ on the shape of Nyquist plot
	58	Assessment of relative stability
	59	Constant M and N circle
	60	Nicholas chart

Amarendra Behera

PREPARED BY: - AMARENDRA BEHERA HOD

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