

PSIET, KARANDA, DHENKANAL

LESSONPLAN Session(2023-2024)

Discipline: Electrical Engg.	Semester: 6 th , Summer/2024	Name of the Faculty: Nabin Kumar Pradhan, Lecturer
Subject: Control Systems Engineering Theory-3	No.ofDays/week: 05	StartDate: 16/01/2024 End Date: 26/04/2024

Week	ClassDay	TheoryTopics
1st	1st	Classification of Controlsystem.
	2nd	Open loop system & Closed loop system and its comparison.
	3rd	Effects of Feed back.
	4th	Standard test Signals(Step, Ramp, Parabolic, and Impulse Functions).
	5th	Standard test Signals (Step,Ramp,Parabolic,andImpulseFunctions).
2nd	1st	Servomechanism.
	2nd	Regulators(Regulating systems)
	3rd	Revision and Doubt clearing.
	4th	Transfer Function of a system.
	5th	Transfer Function of a system.
3rd	1st	Impulse response of a system.
	2nd	Properties, Advantages & Disadvantages of Transfer Function.
	3dr	Poles & Zeroes of transfer Function.
	4th	Representation of poles & Zeroon thes-plane.
	5th	Representation of poles & Zeroon thes-plane.
4th	1st	Simple problems of transfer function of network.
	2nd	Doubt clearing and Classtest.

5th	3rd	Closelooptransferfunction.
	4th	Conceptofcharacteristicsequation
	5th	Conceptofcharacteristicsequation
	1st	BlockDiagramreductiontechnique.
	2nd	BlockDiagramreductiontechnique.
6th	3rd	Stabilityofsystem.
	4th	Blockdiagramreductionproblem.
	5th	BlockDiagramreductiontechnique
	1st	ModelingofElectricalSystems(R,L,C,Analogoussystems).
	2nd	RevisionandDoubtclearing.
7th	3rd	DefinitionofBasicElementsofaBlockDiagram.
	4th	CanonicalFormofClosedloopSystems.
	5th	CanonicalFormofClosedloopSystems.
	1st	RulesforBlockdiagramReductionpart-I
	2nd	RulesforBlockdiagramReductionpart-II
8th	3rd	ProcedureforofReductionofBlockDiagram.
	4th	SimpleProblemforequivalenttransferfunction.
	5th	SimpleProblemforequivalenttransferfunction.
	1st	BasicDefinitioninSFG&properties.
	2nd	Mason'sGainformula.
9th	3rd	StepsforsolvingSignalflowGraph.
	4th	SimpleproblemsinSignalflowgraphfornetwork.
	5th	SimpleproblemsinSignalflowgraphfornetwork.
	1st	DoubtclearingandClasstest.
	2nd	DefinitionofTime,Stability,steady-stateresponse,accuracy,transient accuracy, In-sensitivity and robustness.
	3rd	SystemTimeResponse.
	4th	Frequencyresponseanalysis.
	5th	AnalysisofSteadyStateError.

10th	1st	Types of Input & Steady state Error (Step, Ramp, Parabolic).
	2nd	Parameters of first order system & second-order systems.
	3rd	Derivation of time response Specification (Delay time, Rise time, Peak time, Settling time, Peak overshoot).
	4th	Revision and Doubt clearing.
	5th	Revision and Doubt clearing.
11th	1st	Effect of parameter variation in Open loop System & Closed loop Systems.
	2nd	Introduction to Basic control Action & Basic modes of feedback control: proportional, integral and derivative.
	3rd	Effect of feedback on overall gain, Stability.
	4th	Realization of Controllers (P, PI, PD, PID) with OPAMP.
	5th	Realization of Controllers (P, PI, PD, PID) with OPAMP
12th	1st	Revision and Doubt clearing.
	2nd	Effect of location of poles on stability.
	3rd	Routh-Hurwitz stability criterion.
	4th	Steps for Root locus method.
	5th	Steps for Root locus method.
13th	1st	Root locus method of design (Simple problem).
	2nd	Revision and Doubt clearing.
	3rd	Frequency response, Relationship between time & frequency response.
	4th	Methods of frequency response.
	5th	Methods of frequency response.
14th	1st	Polar plots & steps for polar plot.
	2nd	Bode plot & steps for Bode plots.
	3rd	Stability in frequency domain, Gain Margin & Phase margin.
	4th	Nyquist plots, Nyquist stability criterion.
	5th	Nyquist plots, Nyquist stability criterion.
15th	1st	Simple problems as above.
	2nd	Concepts of state, state variable, state model.

3rd	State models for linear continuous time functions (Simple).
4th	Doubt clearing and Class test.
5th	Doubt clearing and Class test.

Signature of the faculty

Signature of the Principal