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DEPARTMENT OF ELECTRICAL ENGINEERING

Govt. Polytechnic, Balasore

LESSON PLAN FOR ACADEMIC SESSION - 2023-24
CONTROL SYSTEM ENGINEERING
ELECTRICAL MEASUREMENT & INSTRUMENTATION

Course Code : Th.3	Semester : 4th
Total Periods : 75(60+15) Periods	Examination : 3 Hours
Theory Periods : 4 P/Week	Internal Assessment : 20 Marks
Tutorial : - 1 P/Week	End Semester Examination : 80 Marks
Maximum Marks : 100	
Semester From Date : 16/01/2024 To Date :	
Name of Teaching Faculty: Er. ANITA SHIAL ,LECT. (EE)	

WEEK	PERIOD	TOPIC
1st	1 st	Define Accuracy, precision, Errors, Resolutions Sensitivity and tolerance
	2 nd	Classification of measuring instruments.
	3 rd	Explain Deflecting arrangements in indicating type of instruments.
	4 th	Explain controlling arrangements in indicating type of instruments.
	5 th	Explain damping arrangements in indicating type of instruments.
2 nd	1 st	Calibration of instruments.
	2 nd	Describe Construction, principle of operation, errors, ranges merits and demerits of Moving iron type instruments.
	3 rd	Describe Construction, principle of operation, errors, ranges merits and demerits of Moving iron type instruments(continue..)
	4 th	Describe Construction, principle of operation, errors, ranges merits and demerits of Permanent Magnet Moving coil type instruments.
	5 th	Describe Construction, principle of operation, errors, ranges merits and demerits of Permanent Magnet Moving coil type instruments(continue..)
3 rd	1 st	Describe Construction, principle of operation, errors, ranges

		merits and demerits of Dynamometer type instruments
	2 nd	Describe Construction, principle of operation, errors, ranges merits and demerits of Dynamometer type instruments(continue..)
	3 rd	Describe Construction, principle of operation, errors, ranges merits and demerits of Rectifier type instruments
	4 th	Describe Construction, principle of operation, errors, ranges merits and demerits of Induction type instruments
	5 th	Extend the range of instruments by use of shunts resistor
4 th	1 st	Extend the range of instruments by use of Multipliers.
	2 nd	Solve Numerical
	3 rd	Solve Numerical(continue..)
	4 th	Describe Construction, principle of working of Dynamometer type wattmeter .
	5 th	Errors in Dynamometer type wattmeter
5 th	1 st	methods of their Error correction
	2 nd	Discuss L P F type Dynamometer wattmeter
	3 rd	Discuss U P F type Dynamometer wattmeter
	4 th	Discuss Induction type watt meters
	5 th	Single Phase Induction type Energy meters (introduction)
6 th	1 st	Single Phase Induction type Energy meters – construction & working principle
	2 nd	Single Phase Induction type Energy meters – construction & working principle(continue..)
	3 rd	their compensation and adjustments.
	4 th	Testing of Energy Meters
	5 th	Different types of Tachometers(introduction)
7 th	1 st	working principles of Tachometers
	2 nd	Principle of operation and construction of Mechanical Type frequency meters
	3 rd	Principle of operation and construction of Mechanical Type frequency meters(continue...)
	4 th	Principle of operation and construction of Electrical resonance Type frequency meters.
	5 th	Principle of operation and construction of Electrical resonance Type frequency meters(continue...)
8 th	1 st	Principle of operation and working of Dynamometer type single phase power factor meters.
	2 nd	Principle of operation and working of Dynamometer type three phase power factor meters
	3 rd	Classification of resistance
	4 th	Measurement of low resistance by potentiometer method
	5 th	Measurement of medium resistance by wheat Stone bridge method
9 th	1 st	Measurement of high resistance by loss of charge method
	2 nd	Construction, principle of operations of Megger for measurement of insulation resistance
	3 rd	Construction, principle of operations of Earth tester for earth resistance measurement
	4 th	Construction and principles of Multimeter. (Analog)
	5 th	Construction and principles of Multimeter. (Digital)
10 th	1 st	Measurement of inductance by Maxwell's Bridge method

	2 nd	Measurement of capacitance by Schering Bridge method	
	3 rd	Define Transducer, sensing element or detector element and transduction elements	
	4 th	Classify transducer. Give examples of various class of transducer, Resistive transducer.	
	5 th	Linear motion potentiometer	
	1 st	angular motion potentiometer	
11 th	2 nd	Thermistor and Resistance thermometers	
	3 rd	Wire Resistance Strain Gauges, Inductive Transducer	
	4 th	Principle of linear variable differential Transformer (LVDT), Uses of LVDT	
	5 th	Capacitive Transducer. General principle of capacitive transducer	
	1 st	Variable area capacitive transducer, Change in distance between plate capacitive transducer	
12 th	2 nd	Piezo electric Transducer (their applications)	
	3 rd	Hall Effect Transducer (their applications)	
	4 th	Principle of operation of Cathode Ray Tube	
	5 th	Principle of operation of Oscilloscope (with help of block diagram	
	13 th	1 st	Measurement of DC Voltage & current by CRO
		2 nd	Measurement of AC Voltage, current by CRO.
		3 rd	Measurement of AC phase & frequency BY CRO.
4 th		Overall Discussion	
5 th		Overall Discussion	
14 th		1 st	Overall Discussion
		2 nd	Previous year question Discussion
	3 rd	Tutorial	
	4 th	Tutorial	
	5 th	Tutorial	
15 th	1 st	Tutorial	
	2 nd	Tutorial	
	3 rd	Tutorial	
	4 th	Tutorial	
	5 th	Tutorial	

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