

ELECTRICAL MEASUREMENT & INSTRUMENTATION (Th. 03)

Date of Commencement of classes: 14.02.2023

Date of Closing of classes: 23.05.2023

LIST OF WEEK/ MONTH WISE AVAILABLE DAYS/ PERIODS

Sl. No.	Month	Week-wise no. of academic days available					Total no. of academic days
		Week- 1	Week- 2	Week- 3	Week- 4	Week- 5	
1	February	--	--	4	6	3	13
2	March	2	5	4	4	6	21
3	April	5	4	4	5	2	20
4	May	3	6	5	--	--	14
Total		10	15	12	15	11	68

NO. OF AVAILABLE CLASSES PER WEEK/ MONTH

Sl. No.	Month	Week-wise no. of academic periods available					Total no. of academic periods
		Week- 1	Week- 2	Week- 3	Week- 4	Week- 5	
1	February	--	--	4	6	3	13
2	March	2	5	4	4	6	21
3	April	5	4	4	5	2	20
4	May	3	6	5	--	--	14
Total		10	15	12	15	11	63

CHAPTER-WISE DISTRIBUTION OF PERIODS

Sl. No.	Name of the Chapter	Periods as per Syllabus	Required period	Expected Marks
01	MEASURING INSTRUMENTS	05	05	05
02	ANALOG AMMETERS AND VOLTMETERS	10	10	20
03	WATTMETER AND MEASUREMENT OF POWER	08	06	20
04	ENERGYMETERS AND MEASUREMENT OF ENERGY	08	05	10
05	MEASUREMENT OF SPEED, FREQUENCY AND POWER FACTOR	07	07	10
06	MEASUREMENT OF RESISTANCE INDUCTANCE AND CAPACITANCE	08	08	10
07	SENSORS AND TRANSDUCER	09	09	10
08	OSCILLOSCOPE	05	06	10
	TOTAL	60	56	100

Lesson Plan By –PRAJNADIPTA SAHOO

LESSON PLAN

Name of the Month	Week No.	Class day	Art. No.	Theory Topics	
F E B R U A R Y	3 rd	1 st	1.0	Chapter No.- 01 (Measuring Instruments) Introduction to Measurement, Instrument, Standard	
		2 nd	1.1	Define Accuracy, precision, Errors, Resolutions Sensitivity & Tolerance	
		3 rd	1.2	Classification of measuring instruments.	
		4 th	1.3	Explain Deflecting torque of an instrument-controlling and damping arrangements in indicating type of instrument	
	4 th	1 st	1.4	Calibration of instruments	
		2 nd	2.1	Chapter No.- 02 (Analog Ammeters and Voltmeters) Describe construction, principle of operation, errors, ranges merits and demerits of Moving iron type instruments-construction, principle of operation	
			2.1.1	-errors & ranges, Merits & demerits	
		3 rd			
		4 th	2.1.2	Permanent Magnet Moving coil type instruments. - construction & principle of operation	
		5 th		-error, range & merits & demerits	
		6 th	2.1.3	Dynamometer type instruments -construction principle of operation-errors, ranges, merits & demerits	
		5 th	1 st		-errors, ranges, merits & demerits
			2 nd	2.1.4	Rectifier type instruments
	3 rd		2.1.5	Induction type instruments	
	M A R C H	1 st	1 st	2.2	Extend the range of instruments by use of shunts and Multipliers.
2 nd			23	Solve numerical	
2 nd		1 st	3.1	Chapter No.- 03(Wattmeter and measurement of Power) Describe Construction of dynamometer type wattmeter	
		2 nd		principle of working Dynamometer type wattmeter	
		3 rd		Discuss L P F Electro – Dynamometer type wattmeter	
		4 th		Discuss U P F Electro – Dynamometer type wattmeter	
		5 th	3.2	The Errors in Dynamometer type wattmeter and methods of their correction	
3 rd		1 st	3.3	Discuss Induction type wattmeters	
		2 nd	4.1	Chapter No.- 04 (Energy meters and measurement of energy) Introduction -Single Phase induction type energy meter-	
		3 rd	4.2	Construction. working Principle & their	
		4 th		-Compensation and adjustments	
4 th		1 st		- Compensation and adjustments.	
		2 nd	4.3	Testing of energy Meters	

		3 rd	5.1	Chapter No.- 05 (Measurement of Speed Frequency and Power Factor) Tachometers, types
		4 th		Tachometer working principles
	5 th	1 st	5.2	Principle of operation and construction of Mechanical resonance type frequency meter
		2 nd		Cont...
		3 rd		- Electrical resonance Type frequency meters.
		4 th	5.3	Principle of operation and working of Dynamometer type single phase power factor meter
5 th	Three phase power factor meters			
		6 th	6.1	Chapter No.- 06 (Measurement of Resistance, Inductance and Capacitance) Classification of resistance
A P R I L	1 st	1 st	6.1.1	Measurement of low resistance by potentiometer method
		2 nd	6.1.2	Measurement of medium resistance by wheat Stone bridge method
		3 rd	6.1.3	Measurement of high resistance by loss of charge method.
		4 th	6.2	construction & principle of operations Megger and Earth tester for insulation resistance and Earth resistance measurement respectively
		5 th	6.3	Explain construction and principles of Multimeter (Analog and Digital).
	2 nd	1 st	6.4	Measurement of Inductance by Maxwell's Bridge method
		2 nd	6.5	Measurement of capacitance by Schering Bridge method
		3 rd	7.1	Chapter No.- 07 (Sensors and Transducers) Define transducer, sensing element or detector element and transduction elements
		4 th	7.2	Classify transducer. give examples of various class of transducer
	3 rd	1 st	7.3	Resistive transducer
		2 nd	7.3.1	Linear and angular motion Potentiometer.
			7.3.2	Thermistor and Resistance Thermometer
		3 rd	7.3.3	Wire resistance strain gauges
	4 th	4 th	7.4	Inductive transducer
			7.4.1	Principle of linear variable differential transformer (LVDT),
			7.4.2	Uses LVDT
	4 th	1 st	7.5	Capacitive transducer),
			7.5.1	General principle of capacitive transducer
			7.5.2	Variable area capacitive transducer
	4 th	2 nd	7.5.3	Change in distance between plate capacitive transducer
3 rd		7.6	Piezo electric transducer and its application and Hall effect transducer with their application	

		4 th	8.1	Chapter No.- 08 (Oscilloscopes) Principle of operation of cathode ray tube
		5 th	8.2	Principle of operation of oscilloscope (with help of block diagram)
	5 th	1 st		Cont...
		2 nd	8.3	Measurement of DC voltage & current
M A Y	1 st	1 st	8.4	Measurement of AC voltage, current, phase & frequency
		2 nd		Cont.
		3 rd		Chapter 1&2 Revision
	2 nd	1 st		Chapter 3 & 4 Revision
		2 nd		Chapter 5 & 6 Revision
		3 rd		Chapter 7 Revision
		4 th		Chapter 8 Revision
		5 th		Previous Year question Answer discussion
		6 th		Cont.

Coverage of Chapters up to the internal assessment (**Up to 2nd week of May**): **1, 2 & 3**

Learning Resources:

Sl. No.	Name of the Book	Author Name	Publisher
01	A.K. Sawhney	Electric Measurement and Measuring instruments	Dhanpat Rai & Co
02	J. B. Gupta	Electrical and Electronics Measuring instruments and Measurement	S.K.Kataria & Sons