GOVT. POLYTECHNIC KORAPUT
DEPARTMENT OF ELECTRICAL ENGG.

Th3. ELECTRICAL MEASUREMENT & INSTRUMENTATION

Name of the Course: Diploma in Electrical Engineering			
Faculty: S Bichiballi			
Course code:	Th3	Semester	4th
Total Period:	75 (60L + 15T)	Examination	3 hrs
Theory periods:	4P / week	Internal Assessment :	20
Tutorial:	1 P / week	End Semester Examination:	80
Maximum Marks:	100		

TOPIC WISE DISTRIBUTION OF PERIODS

Sl. No.	Topics	Periods
1.	Measuring instruments	05
2.	Analog ammeters and voltmeters	10
3.	Wattmeter and measurement of power	08
4.	Energy meters and measurement of energy	08
5.	Measurement of speed, frequency and power factor	07
6.	Measurement of Resistance, Inductance& Capacitance	08
7.	Sensors And Transducer	09
8.	Oscilloscope	05
Total		**60**

LESSON PLAN

Week	Day	Theory topic
1st	1st	**Measuring instruments:** Define Accuracy, precision, Errors, Resolutions Sensitivity and tolerance.
	2nd	Classification of measuring instruments.
	3rd	Explain Deflecting, controlling and damping arrangements in indicating type of instrument
	4th	Calibration of instruments.
2nd	1st	Problem solving.
	2nd	**Analog ammeters and voltmeters:** Describe Construction, principle of operation, errors, ranges merits and demeritsof: Moving Iron type instrument.
	3rd	Describe Construction, principle of operation, errors, ranges merits and demeritsof: Moving Iron type instrument.
	4th	Describe Construction, principle of operation, errors, ranges merits and demeritsof:

GOVT. POLYTECHNIC KORAPUT
DEPARTMENT OF ELECTRICAL ENGG.

		Permanent Magnet Moving coil type instruments.
3rd	1st	Describe Construction, principle of operation, errors, ranges merits and demeritsof: Permanent Magnet Moving coil type instruments.
	2nd	Describe Construction, principle of operation, errors, ranges merits and demeritsof: Dynamometer type instruments
	3rd	Describe Construction, principle of operation, errors, ranges merits and demeritsof: Rectifier type instruments
	4th	Describe Construction, principle of operation, errors, ranges merits and demeritsof: Induction type instruments
4th	1st	Extend the range of instruments by use of shunts and Multipliers.
	2nd	Problem solving.
	3rd	Problem solving.
	4th	**Wattmeters and measurement of power:** Describe Construction, principle of working of Dynamometer type wattmeter. (LPFand UPF type)
5th	1st	Describe Construction, principle of working of Dynamometer type wattmeter. (LPFand UPF type)
	2nd	Describe Construction, principle of working of Dynamometer type wattmeter. (LPFand UPF type)
	3rd	The Errors in Dynamometer type wattmeter and methods of their correction.
	4th	The Errors in Dynamometer type wattmeter and methods of their correction.
6th	1st	The Errors in Dynamometer type wattmeter and methods of their correction.
	2nd	Discuss Induction type watt meters.
	3rd	Previous year questions discussion.
	4th	**Energymeter and measurement of energy:** Introduction
7th	1st	Single Phase Induction type Energy meters – construction.
	2nd	Single Phase Induction type Energy meters – working principle.
	3rd	Single Phase Induction type Energy meters – compensations.
	4th	Single Phase Induction type Energy meters – adjustments.
8th	1st	Testing of Energy Meters.
	2nd	Testing of Energy Meters.
	3rd	Previous year questions discussion.
	4th	**Measurement of speed, frequency and power factor:** Tachometers, types and working principles
9th	1st	Tachometers, types and working principles
	2nd	Principle of operation and construction of Mechanical and Electrical resonance Type frequency meters.
	3rd	Principle of operation and construction of Mechanical and Electrical resonanceType frequency meters.
	4th	Principle of operation and working of Dynamometer type single phase power factor meter.
10th	1st	Principle of operation and working of Dynamometer type threephase power factor meter.
	2nd	Previous year questions discussion.
	3rd	**Measurement of resistance, inductance& capacitance:**

GOVT. POLYTECHNIC KORAPUT
DEPARTMENT OF ELECTRICAL ENGG.

		Classification of resistance. Measurement of low resistance by potentiometer method.
	4th	Measurement of medium resistance by wheat Stone bridge method.
11th	1st	Measurement of high resistance by loss of charge method.
	2nd	Construction, principle of operations of Megger
	3rd	Earth tester for insulationresistance and earth resistance measurement respectively.
	4th	Construction and principles of Multimeter. (Analog and Digital)
12th	1st	Measurement of inductance by Maxewell's Bridge method.
	2nd	Measurement of capacitance by Schering Bridge method
	3rd	**Sensors and Transducers:** Define Transducer, sensing element or detector element and transductionelements.
	4th	Classify transducer. Give examples of various class of transducer.
13th	1st	Resistive transducer Linear and angular motion potentiometer.
	2nd	Thermistor and Resistance thermometers. Wire Resistance Strain Gauges.
	3rd	Inductive Transducer.
	4th	Principle of linear variable differential Transformer (LVDT), Uses of LVDT.
14th	1st	Capacitive Transducer. General principle of capacitive transducer.
	2nd	Variable area capacitive transducer. Change in distance between plate capacitive transducer.
	3rd	Piezoelectric Transducer and Hall Effect Transducer with their applications.
	4th	**Oscilloscope:** Principle of operation of CRT.
15th	1st	Principle of operation of Oscilloscope (with the help of block diagram).
	2nd	Measurement of DC Voltage & current.
	3rd	Measurement of AC Voltage & current.
	4th	Measurement of phase & frequency.

Signature of concerned faculty

H.O.D Electrical