

# **AMEI-05 ELECTRONICS & MEASURING INSTRUMENTS**

## **UNIT-1 BASIC MEASUREMENT CONCEPTS**

- 1.1 Measurement systems - Static and dynamic characteristics
- 1.2 Units and standards of measurements - error analysis
- 1.3 Moving coil, moving iron meters - multimeters
- 1.4 True RMS meters - Bridge measurements
- 1.5 Maxwell, Hay, Schering, Anderson and Wien bridge.

## **UNIT-2 BASIC ELECTRONIC MEASUREMENTS**

- 2.1 Electronic multimeters
- 2.2 Cathode ray oscilloscopes - block schematic - applications
- 2.3 Special oscilloscopes- Q meters- Vector meters
- 2.4 RF voltage and power measurements.

## **UNIT-3 SIGNAL GENERATORS AND ANALYZERS**

- 3.1 Function generators- RF signal generators
- 3.2 Sweep generators- Frequency synthesizer- wave analyzer
- 3.3 Harmonic distortion analyzer- spectrum analyzer.

## **UNIT-4 DIGITAL INSTRUMENTS**

- 4.1 Comparison of analog and digital techniques- digital voltmeter- multimeters
- 4.2 Frequency counters- measurement of frequency and time interval
- 4.3 Extension of frequency range - measurement errors.

## **UNIT-5 DATA ACQUISITION SYSTEMS AND FIBER OPTIC MEASUREMENTS**

- 5.1 Elements of a digital data acquisition system - interfacing of transducers
- 5.2 Multiplexing- computer controlled instrumentation - IEEE 488 bus
- 5.3 Fiber optic measurements for power and system loss- optical time domains reflectometer.

### **References Books:**

1. Joseph J.Carr, Elements of Electronics Instrumentation and Measurement, Pearson education, 2003. .
2. Alan. S. Morris, Principles of Measurements and Instrumentation, Prentice Hall of India, 2nd edn., 2003.
3. Ernest O. Doebelin, Measurement Systems- Application and Design-Tata McGrawHill-2004.