

**ELECTRONICS INSTRUMENTATION**

**Unit I: BUILDING BLOCKS OF INSTRUMENTATION SYSTEM AND TRANSDUCERS:-**

Block diagram of instrumentation system - performance characteristics of instruments-accuracy, precision sensitivity, linearity, resolution, hysteresis, errors.

Electrical transducers-classification-basic requirement of a transducer - displacement transducer-variable resistance-variable inductance-LVDT-RVDT-variable capacitance-Hall effect, digital, piezoelectric, pressure and temperature transducers-flow meter and photosensitive transducers.

**Unit II: SIGNAL PROCESSING AND CONDITIONING:**

Transducer bridges-instrumentation amplifier - isolation amplifier - logarithmic amplifier - voltage and current amplifier-integrator - differentiator.

Phase sensitive detector-peak detector -sample and hold circuit-RMS count - comparator-linearisation-V to f and f to V converters-filters.

**Unit III: DATA ACQUISITION:-**

Single channel, multi channel data conversion-A/D, D/A converters - multiplexers - PID controller -application of microprocessors: temperature controller-control of petrol engine. Firing angle control of SCR - atmospheric data acquisition.

**Unit IV: ELECTRONIC INSTRUMENTS, RECORDERS AND DISPLAYS:-**

Standard lab. Equipments- signal generator-pulse generator-CRO -VTVM - wave analysis recorders-analog recorders - XY - recorders- stripe chart recorder-oscilloscope recorder-digital recorder- digital readout CRO-digital taperecorder - digital displays.

**Unit V: GENERAL PURPOSE ELECTRONIC INSTRUMENTS**

Digital voltmeters and multimeters - electronic counters - AC millivoltmeter-wave analyzers and spectrum analyzers-frequency synthesizers -lock in amplifier-frequency response analyzer-phase meter.

**BOOKS FOR STUDY:**

1. Instrumentation-Devices and Systems- C.S Rangan, G.R. Sharma and V.S.V. Mani-TMH -1983
2. Electronic Instrumentation and Measurement Techniques-W.D. Cooper, A.D. Helfrix - PHI-1988.
3. Principles of Industrial Instrumentation- D. Patranabis
4. Electrical and Electronic Measurements and Instrumentation-A.K. Sawney-Dhanpat Rai and Sons 1978.