UNIT I

Chapter 1 : Applications of Transducers 1-1 to 1-22

Syllabus : Function of each block of Instrumentation System, Transducer : Need, Classification-Active and Passive, Analog and Digital, Primary and Secondary, Mechanical and Electrical, Electrical Transducers : Resistive transducers - Linear and Angular potentiometers, strain gauge, types, gauge factor. Capacitive transducer, Inductive transducer : LVDT, RVDT. Piezoelectric transducer, photoelectric transducer, photovoltaic cell. Selection criteria of transducer.

UNIT II

Chapter 2 : Pressure Measurement 2-1 to 2-29

Syllabus : Pressure and its units, Types - Absolute, Gauge, Atmospheric, Vacuum, Classification of pressure measuring devices : (a) Manometer - U tube, Inclined Tube, Well type manometer (b) Elastic pressure transducer : Bourdon Tube Bellows, Diaphragm, Capsule (c) Electrical pressure transducers : Bourdon tube with LVDT, Bellow with LVDT Diaphragm with strain gauge, Specification of electrical pressure transducer, Calibration of pressure gauge using dead weight tester.

UNIT III

Chapter 3 : Flow Measurement 3-1 to 3-31

Syllabus : Flow and its units, Types of flow - Laminar, Turbulent, Reynolds number. Classification of flow measuring transducers : (a) Variable head flow meter - Venturimeter, Orifice plate meter, Flow nozzle, Pitot tube, (b) Variable area flow meter - Rotameter, (c) Electrical flow meter - Turbine flow meter, Electromagnetic flow meter, Ultrasonic flow meter - Time difference and Doppler type, Hot wire anemometer, Vortex flow meter, Positive displacement meter - Nutating disc type, Typical specifications of various flow meters.

UNIT IV

Chapter 4 : Level Measurement 4-1 to 4-19

Syllabus : Level and its units, Classification of level measurement methods : Direct methods - Hook type, Sight glass, Hydrostatic type (air purge), Indirect measurement method : Float type with linear and rotary potentiometer, Capacitive type, Ultrasonic type, Nuclear Radiation type, Radar type, Typical specifications of electrical level measurement methods, Calibration of Air purge and capacitance type level system.

UNIT V

Chapter 5 : Temperature Measurements 5-1 to 5-25

Syllabus : Temperature and its Units, temperature scales and conversions. Classification of temperature measuring transducers : (a) Filled system thermometer - vapour pressure thermometer, (b) Expansion thermometer - Bimetallic thermometer. Electrical methods - (a) Thermistors, (b) RTD - (PT-100, 2/3 wire), (c) Thermocouple - Law of intermediate temp and intermediate metals Seebeck and Peltier effect, Types J, K, R, S, T. Pyrometer - Optical method, Radiation method. Typical specifications of Thermistor, RTD and Thermocouple. Calibration of temperature measuring transducers.

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