

Electrical Measurements and Instruments

Code : EI 301

Contacts : 3L+1T

Credits : 4

Module I

General features – Construction and principle of operation of moving coil, moving iron, Dynamometer, Thermal, Rectifier and Electrostatic type instruments. Deflecting, controlling and damping torques, extension of instrument ranges using shunts, multipliers and instrument transformers. [12]

Module II

Static and Dynamic errors: Standard inputs and system analysis for evaluation of such errors. Definitions of precision, hysteresis, nonlinearity, sensitivity, speed of response, fidelity. [2]

Statistical error analysis, mean, median, mode, average, estimates, distribution, probable error, standard deviation, test of normal distribution, chi-squared test curve fitting (a) method of sequential differences (b) method of extended differences and (c) method of least squares [4]

Reliability: definition on the basis of Gaussian and normal distribution function, MTTF, Bath Tub curve, operating life and cumulative failure analysis. [3]

Module III

Measurement of low, medium and high resistances, Kelvins double bridge, multimeters, megger. [5]

Measurement of inductances, capacitance and frequency by A.C. Bridges – Maxwell, Schering, Anderson, De-Sauty, Wien. [5]

Module IV

Localization of cable faults using Murray and Varley loop methods. D.C. and A.C. potentiometers, Measurement of high voltage. [6]

A.C. and D.C. energy meters. [3]