AMCO-10 ELECTRICAL MEASUREMENTS

UNIT-1 UNITS, SYSTEMS, DIMENSIONS AND STANDARDS

1.1 Introduction, Unit, Absolute Units, Fundamental And Derived Units,
1.2 Dimensions, Dimensions Of Mechanical Quantities, Cgs System Of Units, Practical Units,
1.3 Rationalized M.K.S.A System, Si Units, Base Units Of Si, Multiplying Prefixes Of Units,
1.4 Standards And Their Classification, International Standards, Standards For Mass And Length,

UNIT-2 RESISTANCE MEASUREMENTS OF RESISTANCE.

2.1 The Pyrolitic or cracked –carbon resistor, Metal –film resistors, Resistors, Time constant resistors. Measurement of Resistance: Voltmeter Ammeter Method,
2.2 Substitution Method, Direct Deflection Method, Differential Galvanometer Method, Kohlrausch's Method, Wheatstone Bridge, Working of the bridge, Measurement of high-resistances

UNIT-3 POTENTIOMETER

3.1 Analysis of Potentiometer Circuit, Limitation due to the galvanometer sensitivity, Student Type Potentiometer,
3.2 Use of potentiometer in the measurement of resistance , voltage and current: Resistance , Measurement of current , Measurement of high voltages

UNIT-4 A.C.BRIDGES

4.1 Sources and detectors, general form of an a.c. Bridge. Measurement of self-inductance, Maxwell's inductance-capacitance bridge, hay's bridge,
4.2 Anderson's bridge, Owen's bridge, measurement of capacitance, measurement of mutual inductance, Heaviside mutual inductance bridge,
4.3 Campbell's modification of Heaviside bridge, Heaviside Campbell equal ratio bridge,

UNIT-5 ANALOG AMMETERS, VOLTMETERS AND OHMMETERS

5.1 Types of instruments, errors in ammeters and voltmeters, permanent magnet moving coil instrument (pmmc), ammeter shunts, multi-range ammeters, moving iron (m.i.) Instruments,
5.2 General torque equation of moving iron instruments, classification of moving iron instruments, shape of scale of moving iron instruments, multipliers for moving iron instruments,
5.3 Comparison between attraction and repulsion types of instruments, errors in moving iron instruments, electrodynamometer (electrodynamic) type instruments,
5.4 Operating principle of electrodynamometer type instrument, construction of electrodynamometer type, instrument, torque equation of electrodynamometer instruments,
5.5 Hot wire instruments, thermocouple instruments, principle of operation of thermo-electric instruments, electrostatic instruments. , force and torque equations of electrostatic instruments.
5.6 Rectifier type instruments, rectifier elements, multimeters

UNIT-6 INSTRUMENT TRANSFORMER

6.1 Use of instrument transformers, ratios of instrument transformers,

6.2 Burden of an instrument transformer, current transformers, relationships in at current transformer, errors in current transformers, potential transformers,
6.3 Relationships in a potential transformer, errors in potential transformers, reduction of errors in potential transformers, construction of potential transformers,
6.4 High voltage potential transformers, protection of potential transformers

UNIT-7 MEASUREMENT OF NON-ELECTRIC QUANTITIES

7.1 Linear Displacement Transducers, Measurement Of Rotary Displacement, Strain Gauges And Measurement Of Strain, Ballast Circuit, Null Type Wheastone Bridge,
7.2 Deflection Type Wheastone Bridges, Gauge Sensitivity, Temperature Compensation, Adjacent Arm Compensating Gauge, Use Of Two Active Gauges In Adjacent Arms,
7.3 Use Of-Our Active Gauges, Poisson's Method, Practical Strain Bridge, Strain Gauge Calibration, Uses Of Strain Gauges, Measurement Of Pressure,
7.4 Measurement Of Pressure Using Electrical Transducers As Secondary Transducers, Measurement Of Linear Velocity, Moving Magnet Type,
7.5 Measurement Of Angular Velocity, Electrical Tachometers, Electromagnetic Tachometer Generators, Digital Methods, Photoelectric Tachometer,
7.6 Toothed Rotor Variable Reluctance Tachometer, Measurement Of Temperature, Measurement Of Resistance Of Thermometers,
7.7 Salient Features of Resistance Wire Thermometers, Thermistors.

Reference Book:

1. Electrical Engineering, Publisher Katsons, Writer J B Gupta