

# **AMP-24 HIGH VOLTAGE ENGINEERING**

## **UNIT-1 ELECTROSTATIC FIELDS THEIR CONTROL AND ESTIMATION**

- 1.1 Electric field stress, its control and estimation, analysis of Electrical field intensity in Homogenous Isotropic Single dielectric and multi dielectric systems.
- 1.2 Introduction to Numerical methods for the estimation of electric field intensity.

## **UNIT-2 CONDUCTION AND BREAKDOWN IN AIR AND OTHER GASEOUS DIELECTRICS IN ELECTRIC FIELDS**

- 2.1 Ionization processes, Townsend's current growth equation-primary and secondary processes, Townsend's criterion for breakdown in electronegative gasses, Paschen's law,
- 2.2 Breakdown in non-uniform fields and corona discharges, post-breakdown phenomena and application, practical considerations in using gas for insulation purposes.

## **UNIT-3 CONDUCTION AND BREAKDOWN IN LIQUID DIELECTRICS**

- 3.1 Conduction and breakdown in pure liquids,
- 3.2 Conduction and breakdown in commercial liquids.

## **UNIT-4 BREAKDOWN IN SOLID DIELECTRICS**

- 4.1 Intrinsic, Electro-Mechanical and Thermal breakdown, Breakdown of solid dielectrics in practice,
- 4.2 Breakdown of composite insulation, solid dielectrics used in practice,
- 4.3 Application of insulating materials in electrical power apparatus, electronic equipment's.

## **UNIT-5 GENERATION OF HIGH VOLTAGE AND CURRENTS**

- 5.1 Generation of HV DC, HV AC and Impulse Voltage, Generation of impulse currents, Tripping and control of impulse generators.

## **UNIT-6 MEASUREMENT OF HIGH VOLTAGE AND CURRENTS**

- 6.1 Measurement of HV DC, HV AC and impulse voltage and currents.

## **UNIT-7 TESTING AND EVALUATION OF DIELECTRIC MATERIALS AND POWER APPARATUS**

- 7.1 Non – Destructive Testing of dielectric materials, DC resistivity measurement, Dielectric and loss factor measurement, partial discharge measurement, testing of insulators,
- 7.2 Bushing, isolators, circuit breakers, cable, transformers, high voltage motors, surge diverters, radio interference measurement.

## **UNIT-8 HIGH VOLTAGE LABORATORY-DESIGN, PLANNING AND LAYOUT**

- 8.1 Size and dimensions of the equipment and their layout, earthing and its importance.

### **Reference Book:**

1. EHV-AC, HVDC Transmission and Distribution Engg, Publisher Katsons, Sanjay K Shama