AMEL24 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