PS5003 ELECTRICAL DISTRIBUTION SYSTEM

DETAILED SYLLABUS

OBJECTIVES

- To provide knowledge about the distribution system electrical characteristics
- To gain knowledge about planning and designing of distribution system
- To analyze power quality in distribution system
- To analyze the power flow in balanced and unbalanced system

UNIT I INTRODUCTION

Distribution System-Distribution Feeder Electrical Characteristics-Nature of Loads: Individual Customer Load, Distribution Transformer Loading and Feeder Load-Approximate Method of Analysis: Voltage Drop, Line Impedance, “K” Factors, Uniformly Distributed Loads and Lumping Loads in Geometric Configurations.

UNIT II DISTRIBUTION SYSTEM PLANNING

Factors effecting planning, present techniques, planning models (Short term planning, long term planning and dynamic planning), planning in the future, future nature of distribution planning, Role of computer in Distribution planning. Load forecast, Load characteristics and Load models.

UNIT III DISTRIBUTION SYSTEM LINE MODEL

Exact Line Segment Model-Modified Line Model-Approximate Line Segment Model-Modified “Ladder” Iterative Technique-General Matrices for Parallel Lines.

UNIT IV VOLTAGE REGULATION

Standard Voltage Ratings-Two-Winding Transformer Theory-Two-Winding Autotransformer-Step-Voltage Regulators: Single-Phase Step-Voltage Regulators-Three-Phase Step-Voltage Regulators- Application of capacitors in Distribution system.

UNIT V DISTRIBUTION FEEDER ANALYSIS

Power-Flow Analysis- Ladder Iterative Technique -Unbalanced Three-Phase Distribution Feeder- Modified Ladder Iterative Technique- Load Allocation- Short-Circuit Studies.

REFERENCES

1. William H. Kersting," Distribution System Modeling and Analysis " CRC press 3rd edition,2012.
2. Turan Gonen, “Electric Power Distribution System Engineering”, McGraw Hill Company. 1986
3. James Northcote – Green, Robert Wilson, “Control and Automation of Electrical Power Distribution Systems”, CRC Press, New York, 2007.
4. Pabla H S, “Electrical Power Distribution Systems”, Tata McGraw Hill. 2004