

AMP-19 ADVANCE POWER SYSTEM AND DESIGN

UNIT-1 INTRODUCTION

- 1.1 A Perspective, Structure of power systems, Conventional Sources of Electric Energy,
- 1.2 Renewable Energy Sources, Energy Storage, Growth of Power Systems in India.

UNIT-2 REPRESENTATION OF POWER SYSTEM

- 2.1 Single-phase Solution of Balan Three-phase Networks,
- 2.2 One Line Diagram and Impeded Reactance Diagram, Per unit (PU) System,
- 2.3 Complex Power, Synchronous Machine.

UNIT-3 REPRESENTATION OF LOADS, LOAD FLOW STUDIES:

- 3.1 Y'bus by singular Transformation, Load flow problem, Gauss-seidel Method,
- 3.2 Optical system Operation, Automatic Generality voltage Control, Symmetrical F2 Analysis.

UNIT-4 SYMMETRICAL COMPONENTS

- 4.1 Symmetrical Component Transformation, Phase Shift in star Delta Transformers,
- 4.2 Sequence Impedances of transmission Lines,
- 4.3 Sequence Impedances and Sequence Network of power System,
- 4.4 Sequence Impedances and Networks of Synchronous Machine,
- 4.5 Sequence Impedances of Transmission Lines, Sequence Impedances of Transmission Lines,
- 4.6 Sequence Impedances and Networks of Transformers,
- 4.7 Construction of sequence Networks of a power System.

UNIT-5 UNSYMMETRICAL FAULT ANALYSIS

- 5.1 Symmetrical Component analysis of Unsymmetrical Faults,
- 5.2 Single Line-To-Ground (LG) Fault, Line-To-Line (LL) Fault,
- 5.3 Double Line-To-Ground (LLG) Fault, Open Conductor Faults,
- 5.4 Bus Impedance Matrix Method for Analysis of Unsymmetrical Shunt Faults.

UNIT-6 POWER SYSTEM STABILITY

- 6.1 Dynamics of a Synchronous Machine, Power Angle Equation,
- 6.2 Node Elimination Technique, Simple Systems, Numerical Solution of swing Equation,
- 6.3 Multimachine Stability, Some Factors Affecting Transient Stability.

UNIT-7 POWER SYSTEM SECURITY

- 7.1 System State Classification, Security Analysis,
- 7.2 Contingency Analysis, Sensitivity Factors,
- 7.3 Power System Voltage Stability.

Reference Book:

1. Sub Station Engineering Design, Publisher Katsons, Writer R S Dahiya