B.Tech III Year II Semester

JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS) PULIVENDULA

19AEE77- POWER SYSTEMS LAB

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Course Objectives:

- Understand the Relay Operating Characteristics
- Todotheexperiments(inmachineslab)onvariouspowersystemconceptslikedeterminati on of sequence impedance, fault analysis, finding of sub transientreactances.
- Todrawtheequivalentcircuitofthreewindingtransformerbyconductingasuitableexperi ment.
- TodeveloptheMATLABprogramforformationofYandZbuses.TodeveloptheMATLA BprogramsforGauss-Seidelandfastdecoupledloadflowstudies.
- To develop the SIMULINK model for single are a load frequency problem

Conductany10experimentsfromthefollowing:

1. Operating Characteristics of Over Current-Relay and Differential Relay
2. Operating Characteristics of phase sequence Relay and microprocessor based Over Voltage Relay
3. Simulation of Y-Bus Using MATLAB
4. Simulation of Z-Bus Using MATLAB
5. Simulation of Power Flow Using Gauss-Seidel Method for the 3-BusSystem
6. Economic Load Dispatch for Thermal Plant Simulation
7. Determination of Sequence Impedances of Cylindrical Rotor Synchronous Machine
8. LG Fault Analysis on an unloaded alternator, LL Fault Analysis on conventional phases
9. LLG Fault Analysis and LLLG Fault Analysis
10. Determination of Sub-transient reactance of salient pole synchronous machine
11. Equivalent circuit of three winding transformer.
12. Develop a Simulinkmodel for a single area load frequency problem and simulate the same

Reference Books:

1. Modern Power System Analysis–by I.J.Nagrath & D.P.KothariTata MGraw–Hill Publishing Company Ltd ,2nd edition..
2. Power System Analysis – by HadiSaadat Mc Graw-Hill Publishing Company Ltd, Published in April 2009..

Course Outcomes:

At the end of this Course the student will be able to

- Get the practical knowledge on calculation of sequence impedance, fault currents, voltages and sub-transient reactance's. **L1**
- Write a program to determine Y Bus and Z Bus for the given transmission system. **L2**
- Get the knowledge on development of MATLAB program for formation of Y and Z buses, Gauss-Seidel and Fast Decouple Load Flow studies **L3**
- Get the knowledge on development of SIMULINK model for single area load frequency problem. **L4**
- Get the practical knowledge on calculation of sequence impedance, fault currents, **L5**