

13EE4218-POWER SYSTEM OPERATION & CONTROL

(EEE)

Lectures/Week: 4Hrs.
End Exam Duration: 3Hrs

Credits: 4
Sessional Marks: 40
End Exam Marks: 60

UNIT-I

ECONOMIC OPERATION AND UNIT COMMITMENT: Statement of economic dispatch problem – Economic Dispatch Problem, input output curves of thermal power plants-Thermal System Dispatching with network Losses, Lambda –Iteration method (No derivation of loss coefficients).

UNIT –II

HYDROTHERMAL SCHEDULING: Introduction, Hydroelectric power plant models, Scheduling problems(Problems for one Iteration)-Implementation of Short term Hydrothermal scheduling problem.

Need for Unit Commitment, Unit Commitment solution methods-Priority lists method, Forward Dynamic Programming method spinning reserve.

UNIT-III

REACTIVE POWER AND VOLTAGE CONTROL: Basic generator control loops, Cross-coupling between control loops, Exciter types, Exciter modelling, Generator modelling, and Static performance of AVR loop.

Generation and absorption of reactive power, relation between voltage, power and reactive power at a node, single machine infinite bus systems, methods of reactive power control.

UNIT-IV

AUTOMATIC LOAD FREQUENCY CONTROL: Automatic Load frequency control of single area systems, Speed-governing system, Turbine generator response, Static performance of speed governor, Closing of ALFC loop, Concept of control area, Static response of primary ALFC loop, Integral control, ALFC of multi-control area systems (POOL operation), The Two-Area system, Modeling the Tie-Line, Block Diagram representation of Two-Area system, Static response of Two-Area system and Tie-Line Bias control.

UNIT- V

COMPUTER CONTROL OF POWER SYSTEMS: Main Tasks in Power System Operation, SCADA : Division of Tasks between Various Control Centers, Features of SCADA Systems, SCADA Configuration, Energy Management Systems System operating states ,System Security,State Estimation

TEXT BOOKS:

1. "Power generation, operation and control" by Allen J Wood & Woollenberg. John Wiley and Sons.
2. "Electrical Energy Systems Theory" by O.J Elgerd.
3. "A Text book on Power System engineering" by M.L. Soni, P.V. Gupta, U.S. Bhatnagar-Dhanpatrai &co
4. "Switch Gear and Protection", by Sunil S. Rao, Khanna Publishers, New Delhi.

REFERENCES:

1. "Computer Aided Power System Analysis" by G.L.Kusic.
2. "Power System Analysis, Operation and Control" by Abhijit Chakrabarti and Sunita Halder, PHI.
3. "Electric Power Systems" by B.M.Weedy and B.J. Cory.
4. "Modern Power System Analysis" by I J Nagarath and D P Kothari, TMH.