

Power System Planning and Reliability [PSPR]

B.E. Sem. VIII [ELEC]

EVALUATION SYSTEM

	Time	Marks
Theory Exam	3 Hrs.	100
Practical & Oral	–	–
Oral Exam	–	25
Term Work	–	25

SYLLABUS

- 1. Load Forecasting:** Introduction, Classification of Load, Load Growth Characteristics, Peak Load Forecasting, Extrapolation and Co-Relation methods of load Forecasting, Energy Forecasting, Reactive Load Forecasting, and Impact of weather and Factors affecting load Forecasting, Annual, Monthly and Total Forecasting.
- 2. System Planning:**
Introduction to system planning, Its Objectives & Factors affecting to System Planning, Short, Medium and Long Term Planning, Reactive Power Planning.
- 3. Generation and Transmission planning:**
Objectives of generation planning, Factors affecting Generation Planning, Sources of Generation. Objectives of transmission planning Network Reconfiguration,
- 4. Fundamentals of Power system Reliability**
Concepts, Terms and Definitions, outage, failure rate, and outage rate availability, unavailability, Reliability models, Morkov process
Reliability function, Mean time to failure, Hazard Rate Function, Bathtub Curve
- 5. Reliability of Systems**
Serial Configuration, Parallel Configuration, Combined Series – Parallel Systems, System Structure Faction, Minimal Cuts and Minimal Paths
- 6. Generating Capacity: Basic probability methods and Frequency & Duration method:**
Introduction, Generation system model, capacity outage probability table, recursive algorithm, Evaluation of: loss of load indices, Loss of load expectation, Loss of energy
- 7. Operating Reserve :**
General concept, PJM method, Modified PJM method, Security function approach
- 8. Composite generation and transmission system:**
Data requirement, system and load point indices, Impact of component outage on the system reliability, application to simple system

Reference Books :

1. Reliability Evaluation of Power System (*Roy Billinton and Ronald N Allan*), Plenum, Press, 1984
2. Power System Planning (*R.L. Sullivan*) Tata McGraw Hill Publishing Company
3. Reliability Assessment of Large Electric Power Systems (*Roy Billinton and Ronald N Allan*) Kluwer academic publishers, 1988
4. Modern Power System Planning (*X. Wang and J.R. McDonald*) McGraw Hill

