

Question Bank

Automatic Generation & Voltage Control

1. Illustrate the advantages of state variable model.
2. Define AGC?
3. Show the conditions necessary for sharing load operating in parallel between the two synchronous machines?
4. Define area control error.
5. Classify system load?
6. Summarize load frequency control.
7. Discuss the frequency and voltage to be regulated in a power system?
8. Contrast the functions of “speed Governor” and “ speed changer” in a speed governing systems of a turbine generator set.
9. Quote about coherent group of generators?
10. A speed governor system cannot completely eliminate frequency error caused by a step load change in power system. Evaluate this statement.
11. Interpret real power in power system controlled?
12. Analyze briefly free governor operation?
13. Explain the function of load frequency control on a power system?

Power System Security- Reactive power and voltage control

1. Introduce power system security by a short note on it.
2. Discuss sensitivity factors used in security analysis.
3. Explain contingency analysis in detail and its importance.
4. Examine various methods of voltage control and explain any three in detail.
 - (i) Name the generators and consumers of reactive power in a power system.
 - (ii) Describe static VAR compensators? Quote the advantages of SVS.
5. Explain the following methods of voltage control (i) Tap changing transformers (ii) Shunt reactors (iii) Synchronous phase modifiers (iv) Shunt capacitors (v) Series Capacitor
6. Describe the different methods of voltage control? Examine any two methods in detail.
 - (i) Develop a typical excitation arrangement to control the voltage of an alternative and explain.
 - (ii) Explain the role of tap changing transformer in voltage control?
7. Explain Static VAR compensator? Explain its operation. Also state the merits of static VAR compensator over the other methods of voltage control.
8. (i) Demonstrate in brief about generation and absorption of reactive power.
(ii) Point out the relations between voltage, power and reactive power at a node for applications in power system control.
9. Analyze various methods of reactive power control and explain any two in detail.
10. Discuss static and dynamic analysis of AVR.

State Estimation & Load Forecasting

1. Describe Least Square Estimation (LSE) and Weighted LSE for estimation of x (vector of n random variables) using another vector y of variables m ($>n$).
2. Write a short note on application of power system state estimation.
3. Explain static and dynamic state estimation of power system.
4. Write a short note on: (a) Network Observability (b) Pseudo Measurements
5. Write short note on Treatment on Bad Data of state estimation.
6. Introduce load forecasting by a short note on it.
7. Explain load forecasting methodology and estimation of average and trend terms.
8. State the objectives of short-term, medium-term and long term load forecasting.
9. Explain regression analysis for the short-term load forecasting.
10. Derive the expression for estimation of average and trend terms of deterministic part of load in load forecasting method

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Introduction to Power System Deregulation and Restructuring

1. Write a short note on Indian scenario of power systems and Electricity Act, 2003.
2. Describe structure of deregulated power systems in India.
3. Discuss the advantages of Deregulated electricity market in detail.
4. Explain growth of the power sector in India.
5. Write a short note on Electricity market entities and model.
6. Discuss various functions of SCADA with neat diagram. Also list some of the common features of all SCADA systems.
7. Discuss the various functions, system monitoring and control of load dispatch center.

