Reg. No. : | | | | | | | | | | |

Question Paper Code: 31372

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2017

Seventh Semester

Electrical and Electronics Engineering

01UEE702 - POWER SYSTEM OPERATION AND CONTROL

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. State the importance of load forecasting in power system operation.
2. List any two information's that can be obtained from a daily load curve.
3. How is the real power in a power system controlled?
4. Differentiate static and dynamic response of LFC loop.
5. How is voltage control obtained by using tap-changing transformer?
6. Draw the transfer function model of an amplifier involved in AVR loop.
7. Differentiate Unit commitment and Economic load dispatch problem.
8. How will you calculate the full load average production cost involved in priority list method for unit commitment?
9. State the significance of contingency analysis program.
10. Define state estimation.

PART - B (5 x 16 = 80 Marks)

11. (a) (i) A generating station has a maximum demand of 40 *MW* and a connected load of 75 *MW*. If the numbers of units generated in a year are 250 x10^6, Calculate the annual load factor. (8)

(ii) Discuss any two techniques for forecasting power system loads. (8)

Or

(b) Illustrate an overview of power system operation and control and explain the role of computers in effective power system operation. (16)

12. (a) (i) Discuss in detail, the dynamic response of a single area system without integral control following a step disturbance. (10)

(ii) Discuss the role of economic dispatch controller added to load frequency control. (6)

Or

(b) (i) Two 1000 *kW* alternators operate in parallel. The speed regulation of first alternator is 100 % to 103 % from full load to no load and that of other is 100 % to 105%. How will the two alternators share a load of 1200 *kW*. (10)

(ii) Develop the transfer function model of generator-load involved in load frequency control of single area system. (6)

13. (a) Discuss in detail, the static and dynamic analysis of AVR loop. (16)

Or

(b) (i) Describe in detail, how tap changing transformers improve the voltage profile in power system operation. (8)

(ii) Draw and explain the block diagram of AVR with feedback stability compensation. (8)

14. (a) (i) Formulate the economic dispatch problem and derive the coordination equation with the transmission loses neglected. (8)

(ii) Briefly explain the sequential steps involved in the solution of unit commitment problem by priority list method. (8)

Or

(b) (i) Describe the forward dynamic programming algorithm for the solution of unit commitment problem in power system. (8)

(ii) The fuel cost of two units are given by : $F_1 = 1.6 + (25\ P_{G1}) + (0.1\ P_{G1})^2$ Rs/ hr; $F_2 = 2.1 + (32\ P_{G2}) + (0.1\ P_{G2})^2$ Rs/hr. If the total demand on the generators is 250 MW, Calculate the economic load scheduling of the two units. (8)

15. (a) Discuss the importance of various operating states involved in power system state transition diagram and also explain the control strategies incorporated for power system security. (16)

Or

(b) Describe the hardware components and functional aspects of SCADA system using a functional block diagram. (16)

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