Reg. No. :

Question Paper Code: 37302

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

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. What is Average demand?

2. What is Plant use factor?

3. How is the real power in a power system controlled?

4. What is area control error?

5. What are the methods of voltage control?

6. Write about Static VAR Compensator (SVC).

7. Define spinning reserve.

8. Define economic dispatch problem.

9. Define FLAPC.

10. Define state estimation.

PART - B (5 x 16 = 80 Marks)

11. (a) (i) Explain the following terms: Installed reserve, spinning reserve, cold reserve, hot reserve. (6)

    (ii) A power station has to meet the following demand:

    Group A:200KW between 8 A.M and 6 P.M

    Group B:100KW between 6 A.M and 10 A.M

    Group C:50KW between 6 A.M and 10 A.M

    Group D:100KW between 10 A.M and 6 P.M and then between 6 P.M and 6 A.M. Plot the daily load curve and calculate diversity factor, units generated per day and load factor (10)

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) Discuss in detail, the Static and dynamic response of a single area system without integral control following a step disturbance. (16)

Or

    (b) Estimate the primary ALFC loop parameters for a control area having the following data.

    Total rated area capacity Pr=2000MW.

    Normal operating load Pd=1000MW.

    Inertia constant H=5.0

    Regulation R=2.40 Hz/pu MW (all area generators)

    We shall assume that the load frequency dependency as linear meaning that the old load would increase 1% for 1% frequency increase. (16)

13. (a) Draw the diagram of a typical automatic voltage regulator and develop its block diagram representation. (16)

Or

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(b) (i) Discuss generation and absorption of reactive power. (8)

   (ii) Explain the injection of reactive power by switched capacitors to maintain acceptable voltage profile and to minimize transmission loss in a power system. (8)

14. (a) Formulate the co-ordination equations with losses neglected and also explain the algorithmic steps of iterative method to find the solution of co-ordination equations. (16)

Or

(b) Explain various constraints in UC and indicate the steps involved in solving in solving UC by DP method. (16)

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) Explain the security monitoring using state estimation with necessary diagrams. (16)

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