Reg. No. :

Question Paper Code: 31372

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

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 difference between load curve and load duration curve.

2. State the difference between p-f and q-v control.

3. What is area control error?

4. What is meant by free governor action?

5. What are the methods of voltage control?

6. Compare shunt and series capacitor.

7. Define spinning reserve.

8. Write the equality and inequality constraints considered in the economic dispatch problem.

9. Explain the function of energy control centre.

10. Define FLAPC.

11. (a) (i) What are the information's obtained from load curve and load duration curve?

(8)

   (ii) A diesel supplies the following loads to various customers:

   Industrial consumer $\quad=\quad$ 1500 KW

   Commercial establishment $\quad=\quad$ 750 KW

   Domestic power $\quad=\quad$ 100 KW

   Domestic light $\quad=\quad$ 450 KW

   If the maximum demand on the station is 2500 KW and the number of kwh generated per year is 45×10^6, determine

   (1) Diversity factor $\qquad$ (2) Annual load factor $\qquad$ (8)

Or

(b) (i) Draw and explain the basic p-f and q-v control loops. (8)

   (ii) Write short notes on load forecasting. (8)

12. (a) Derive the transfer function model and draw the block diagram for a single control area provided with governor system. (16)

Or

(b) Two synchronous machines with the following data are operating in parallel to feed a common load of 300MW

   Machine 1: Governor Speed droop: 4%. Speed changer set to give 75% rated load at rated speed.

   Machine 2: Governor Speed droop: 3%. Speed changer set to give 50% rated load at rated speed. The nominal frequency of operation of the set is 50 Hz.

   Determine the load taken by each machine and the frequency of operation. (16)

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

Or

(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) Draw the power system state transition diagram and explain the various states of the system and control actions to be taken to make the system secure.

(16)

Or

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

(16)

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