Roll No. .....

23259

M.Tech (Electrical Engg) Specialization: Electrical Power System Ist Semester Examination– January, 2013

Power System Operation and Control

Paper MTEPS-103

Time : 3 hours *Max. Marks : 100*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard will be entertained after the examination.

Note : Attempt any **five** questions.

1. (a) What is meant by unit commitment and how does it differ from economic load dispatch problem ? 10

(b) Explain briefly the different methods of solving the unit commitment problem. 10

2. What is dynamic programming ? Illustrate the application of dynamic programming for preparing an optimal unit commitment table for a sample system. 20

3. (a) Explain briefly the load frequency control. 10

(b) Two turboalternators rated for 110 MW and 210 MW have governor drop characteristic of 5% from no load to full load. They are connected in parallel to share a load of 250 MW. Determine the load shared by each machine assuming free governor action. 10

4. (a) Discuss the dynamic response of a single area system without integral control, following a step load disturbance. 10

(b) The data pertaining to a single area power system with linear load frequency characteristic are as : 10

rated capacity: 2000 MW,

system load = 1000 MW,

Inertia constant = 5 sec.

Speed regulation = 0.03 pu,

Load damping factor = 1 pu,

Nominal freq. = 50 Hz;

Governor time const. = 0 sec;

Turbine time const = 0 sec;

For a sudden charge of 40 MW, determine the steady state frequency deviation.

5. (a) Explain how the tieline power deviation can be incorporated in two area system block diagram. 10

(b) What are the features of the dynamic response of a two area system for step load disturbances ? 10

6. Describe, how optimal control can be determined in case of load frequency control problem. 20

7. (a) Write the expression for hourly loss of economy resulting from error in incremental cost representation. 10

   (b) Explain the problem of scheduling hydro-thermal power plants and what are the constraints in the problem ? 10

8. Write notes on : 10×2

   (i) Hard limits and slack variables

   (ii) Power tools.
