

AJAY KUMAR GARG ENGINEERING COLLEGE, GHAZAIABAD
DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
SESSIONAL TEST – 2

Course: B. Tech
Session: 2017-18
Subject: Power System Operation Control
Max. Marks: 50

Semester: VII
Section: EN-1, 2
Sub. Code: NEN 031
Time: 2 hour

Section-A

A. Attempt all parts.

(5x2 = 10)

1. Why load prediction is important in power system?
2. What do you understand by penalty factor of economically operating power system?
3. Explain the advantage of PI controller in frequency control.
4. What do you mean by free governor operation of a generator?
5. What do you understand by droop characteristic of load frequency control?

Section-B

B. Attempt all parts.

(5x5 = 25)

6. What is unit commitment problem? Discuss constraints in unit commitment.
7. Explain input-output characteristics of thermal and hydropower plant.
8. Explain the hydro-thermal economic load scheduling and derive the necessary equations.
9. Discuss dynamic response for an isolated power system.
10. A 500 MW generator is operating to a load of 20 MW. A load change of 1% causes the frequency to change by 1%, if the system frequency is 50 Hz, determine the value of load damping factor in per unit.

Section-C

C. Attempt all parts.

(2x7.5 = 15)

11. Draw a complete block diagram of load frequency control of isolated power system.
12. A two bus system is shown in following fig. If 100MW is transmitted from plant 1 to the load, a transmission loss of 10 MW is incurred. Find the required generation for each plant and the power received by the load when the λ is Rs. 25/MWh.

Also consider the system with a load of 237.04 MW at bus 2. Find the optimum load distribution between the two plants (1) when losses are included but not coordinated and (2) when losses are also coordinated. Also find the savings in rupees per hour when losses are coordinated. The incremental fuel costs of the two plants are given below;

$$\frac{dC_1}{dP_{G1}} = 0.02P_{G1} + 16.00 \text{ Rs/MWh}$$

$$\frac{dC_2}{dP_{G2}} = 0.04P_{G2} + 20.00 \text{ Rs/MWh}$$

