

2125
M.E. Electrical Engineering (Power System)
First Semester
EE (PS)-8102: Power System Operation and Control

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt any five questions.

x-x-x

1. Discuss algorithm for scheduling of power system having pumped storage hydro units, during off-peak seasons. (10)
2. Discuss load sharing between two synchronous machines running in parallel. Draw speed-load characteristics. (10)
3. Discuss one method for minimisation of cost of generators subject to suitable constraints of hydro-thermal scheduling. (10)
4. Two generating units A and B have full load capacities of 500 MW and 210 MW respectively. The interconnector connecting two stations has a motor-generator set (plant C) of full load capacity 50 MW, near station A. Percentage changes of speeds of A, B and C are 5, 4 and 2.5 respectively. The loads on bus bars A and B are 250 MW and 100 MW respectively. Determine the load taken by set C and indicate the direction in which the energy is flowing. (10)
5. Explain different constraints of unit commitment problem. Also, discuss priority method for its solution. (10)
6. (a) Explain why utilisation factor of a plant may be more than 1.
(b) Discuss need of reserves in power system operation and control. (2x5)

P.T.O.

(2)

7. A system consists of two plants connected by a tie-line and a load is located at plant 2. When 100 MW are transmitted from plant 1, a loss of 10 MW takes place on tie-line. Find generation schedule at both plants and power received by the load when λ for system is Rs. 25 per MWh and incremental fuel costs are:

$$\frac{dF_1}{dP_1} = 0.03P_1 + 17 \text{ Rs./MWh}$$

$$\frac{dF_2}{dP_2} = 0.06P_2 + 19 \text{ Rs./MWh}$$

(10)

8. Use suitable examples to explain following terms:

- a) Load-duration curves
- b) Load factor
- c) Diversity factor
- d) Utilisation factor

(4x2½)

x-x-x