

2123  
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 the effect of off-peak loads on the load factor of a system.  
The residential, commercial and industrial loads of a town are as under:

Time	12-5	5-7	7-8	8-12	12-2	2-6	6-9	9-12
MW	0.1	2	1	4	1	4	6	0.5

It is proposed to add irrigation tube well load having a constant maximum demand of 2 MW from 9pm to 8am on same system. Draw chronological, load duration and energy load curves before and after addition of tube well load.

(10)

2. Discuss the need of reserves in PSOC. Explain different types of it.

(10)

3. Consider a system having 4 thermal generating units with parameters given in below table. It is required to determine the most economical units to be committed for a load of 9MW. The change of load in steps of 1MW can be considered. The recursive relation is:

$$F_N(x) = \text{Min}_y \{F_N(y) + F_{N-1}(x-y)\}$$

where symbols used represent usual meaning.

(10)

4. (a) Explain priority list method for solving unit commitment problem.

(b) Discuss base factor and participation factor for power system economic dispatch.

(5, 5)

5. Give mathematical formulation involving minimisation of cost of generators subject to suitable constraints of H-T scheduling.

(10)

6. Discuss how dynamic programming approach is applied to optimal scheduling of hydrothermal problem.

(10)

7. What are basic controls available for power system operation to supply quality power? Give schematic diagrams of such control loops of turbo-generator unit.

(10)

8. Two generators rated 200 MW and 400 MW are operating in parallel. The drop characteristics of their speed governors are 4% and 5% respectively from no-load to full-load. The speed changers are so set that the generators operate at 50 Hz sharing the full load of 600 MW in the ratio of their ratings. If the load reduces to 400 MW, how will it be shared among the generators and what will be the system frequency? Assume free governor operation.

(10)

x-x-x