

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-150
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EEP/EE/EEE)
Power System Operation & Control
(REVISED)

[Time: Three Hours]

[Max.Marks: 80]

Please check whether you have got the right question paper.

- N.B
1. Q.No.1 from section A and Q.No.6 from section B are compulsory.
 2. Solve any five questions from Q.no 1 and Q no.6
 3. Attempt any two questions from the remaining questions in each section
 4. Assume suitable data wherever necessary.

Section- A

- | | | |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| Q.1 | Solve any five. | 10 |
| | <ol style="list-style-type: none"> a. What is amortisseur circuit in synchronous machines? b. What are the significance of dq0 transformation? c. What is AVR? d. Classify stability of dynamic system? e. What is brushless excitation system? f. Define the small signal stability g. Write down MMF equation for three phases and draw waveforms. | |
| Q.2 | <ol style="list-style-type: none"> a. Explain physical interpretation of dq0 transformation. b. In terms of modeling, explain stator circuit equation, mutual inductance between stator and rotor. | 08
07 |
| Q.3 | <ol style="list-style-type: none"> a. Derive the transfer function for steam turbines b. Explain the control and protective functions in excitation systems. | 08
07 |
| Q.4 | <ol style="list-style-type: none"> a. Explain the state - space representation in stability of dynamic system. b. Explain the effect of synchronous machine field circuit dynamics. | 08
07 |
| Q.5 | Write short note on- <ol style="list-style-type: none"> a. Automatic voltage regular. b. Brushless excitation system c. Requirement for a transient droop in governor for hydraulic turbine. | 05
05
05 |

Section -B

Q.6 Solve any five questions. 10

- What is economic load dispatch
- What is the incremental cost expression for hydro generating plant?
- What is the synchronous condenser?
- Define long range hydro scheduling problem
- How shunt capacitors providers' reactive power for voltage control?
- What is contingency analysis?
- What is optimum scheduling of hydrothermal system?

Q.7 a) Explain economic load dispatch problem formulation 07
 b) The incremental fuel costs in rupees per mwh for a plant consisting of two units are 08

$$\frac{dF_1}{dP_{G_1}} = 0.10P_{G_1} + 20$$

$$\frac{dF_2}{dP_{G_2}} = 0.12P_{G_2} + 16$$

The min and max load on each unit is 20 mw & 125mw respectively. determine the incremental fuel cost and allocation of load two units for minimum cost when loads are

- 100MW
- 150MW

Determine the saving in fuel cost in Rs/hr for economic distribution of 200 mw load compared with equal distribution of the same total load.

Q.8 a) Explain in brief roles of SCADA system in energy management system 08
 b) Explain the causes of reactive power generation in power system .also explain the absorption of reactive power. 07

Q.9 a) Explain in detail energy management system and its implementation steps. 08
 b) Explain the power system security assessment in details. 07

Q.10 Write short note on. 05
 a) Application of tap changing transformers for transmission systems. 05
 b) Distribution system voltage regulation. 05
 c) Static VAR system. 05