

$$\frac{dC_1}{dPG_1} = 28 + 0.10 PG_1 \text{ Rs. per MWh}$$

$$15 \leq PG_1 \leq 125$$

$$\frac{dC_2}{dPG_2} = 30 + 0.15 PG_2 \text{ Rs. per MWh}$$

$$25 \leq PG_2 \leq 125$$

$$\frac{dC_3}{dPG_3} = 30 + 0.16 PG_3 \text{ Rs. per MWh}$$

$$30 \leq PG_3 \leq 125$$

No. of Printed Pages : 04

Roll No.

G-23

B. Tech. EXAMINATION, Dec. 2017

(Seventh Semester)

(B. Scheme) (Main & Re-appear)

(EE)

EE-407-B

**POWER SYSTEM OPERATION
AND CONTROL**

Time : 3 Hours]

[Maximum Marks : 75

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

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. Draw the complete block diagram of load frequency of an isolated power system. Obtain the steady state change in frequency for unit step change in demand power. Hence draw the load frequency characteristics of speed governor system.
2. Develop the formula for change in the line power in two area load frequency control. Define and describe the ACE in two area load frequency control. Hence develop the composite block diagram two area load frequency control.

Unit II

3. What is the role of Excitation Systems in Power Systems ? Describe Static Excitation Systems. Develop the model for Type 1S excitation systems.
4. Describe the Boost buck excitation system. Develop its block diagram model.

Unit III

5. Define Voltage Stability, Voltage collapse and obtain the PV and QV curve for purely inductive load.
6. The steady state limit of a power system is 100 MW. A generator with constant excitation is supplying 50 MW to the system. Estimate the maximum permissible sudden increase in generator output without causing instability.

Unit IV

7. What do you mean by penalty factor in economic dispatch ? How is its effect is incorporated ?
8. Three power plants of total capacity 425 MW are scheduled for operation to supply total system load of 280 MW. Find the optimum load scheduling if the plants have the following incremental cost characteristics and the generator constraints :