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R-13

Code : 1G263

III B.Tech. II Semester Supplementary Examinations February 2021

Power System Operation and Control

(Electrical & Electronics Engineering)

Max. Marks: 70

Time: 03 Hours

Answer *any five* questions

All Questions carry equal marks (14 Marks each)

1. Explain the significance of the heat rate curve and cost curve of thermal power plants with neat diagrams. 14M
2. a) Derive the expressions for loss coefficients. 6M
b) The cost characteristics of two power plants connected together by a transmission line and load at plant 2 are given below. When 100 MW are transmitted from plant-1, the transmission loss is 12MW.
 $C_1 = 0.05 P_1^2 + 15 P_1$ Rs/hr
 $C_2 = 0.06 P_2^2 + 18 P_2$ Rs/hr
Find the optimum generation when $P_2 = 22$ 8M
3. a) Discuss the demerits of hydrothermal coordination in optimal generation scheduling. 8M
b) Develop the hydroelectric power plant model with necessary block diagram. 6M
4. a) Explain the block diagram representation of an isolated power system with diagram. 7M
b) Derive the generator load model and represent it by a block diagram. 7M
5. a) Discuss in detail the importance of load frequency control. 7M
b) Draw and explain the block diagram of the load frequency control for a single area system. 7M
6. Derive an expression for steady state change of frequency and the line power transfer of a two area power system. List out the assumptions made. 14M
7. a) Discuss the merits and demerits associated with series compensators. 7M
b) What is load compensation? Describe briefly different compensation methods in power system. 7M
8. a) Explain briefly about the reasons for restructuring / deregulation of power industry 8M
b) Discuss briefly the significant benefits of power industry deregulation. 6M
