

Code No: R41024

R10**Set No. 1**

IV B.Tech I Semester Supplementary Examinations, March/April - 2016

POWER SYSTEM OPERATION AND CONTROL

(Electrical and Electronics Engineering)

Time: 3 hours**Max. Marks: 75****Answer any FIVE Questions****All Questions carry equal marks**

- 1 a) Discuss in detail about incremental heat rate curve and cost curve. [7]
 b) A power System consists of two, 125 MW units whose input cost data are represented by the equations :
 $C_1 = 0.04 P_1^2 + 22 P_1 + 800$ Rupees/hour
 $C_2 = 0.045 P_2^2 + 15 P_2 + 1000$ Rupees/hour
 If the total received power $P_R = 200$ MW. Determine the load sharing between units for most economic operation. [8]
- 2 a) Assuming any relevant data and notation, derive the transmission loss formula. [7]
 b) The incremental fuel cost for two plants are
 $dC_1 / d P_{G1} = 0.075 P_{G1} + 18$ Rs./MWh
 $dC_2 / d P_{G2} = 0.08 P_{G2} + 16$ Rs./MWh
 The loss coefficients are given as
 $B_{11} = 0.0015 / \text{MW}$, $B_{12} = -0.0004 / \text{MW}$ and $B_{22} = 0.0032 / \text{MW}$ for $\lambda = 25$ Rs./MWh.
 Find the real power generations, total load demand and the transmission power loss. [8]
- 3 Describe different methods for solving hydro thermal scheduling. [15]
- 4 a) What is unit commitment problem? Discuss the constraints that are to be accounted in unit commitment problem. [7]
 b) Using dynamic programming method, how do you find the most economical combination of the units to meet a particular load demand? [8]
- 5 a) Describe the mathematical model of Speed - Governing System. [7]
 b) Develop the mathematical model of single control area and obtain its block diagram representation. [8]

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- 6 a) Explain the state variable model of two area load frequency controller with integral action. [7]
- b) Two power stations A & B are inter connected by tie line and an increase in load of 300 MW on system B causes a power transfer of 150 MW from A to B. When the tie line is open the frequencies of system a is 50 c/s and of system B is 49.6 c/s. Determine the values of K_A & K_B which are the power frequency constants of each generator. [8]
- 7 Discuss the importance of combined load frequency control and economic dispatch control with a neat block diagram. [15]
- 8 a) Write advantages and disadvantages of different types of compensating equipment for transmission systems. [7]
- b) Briefly describe about FACTS devices. [8]