



IV B.Tech I Semester Supplementary Examinations, October/November-2019 POWER SYSTEM OPERATION AND CONTROL

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 70

Question paper consists of Part-A and Part-B Answer ALL sub questions from Part-A Answer any THREE questions from Part-B *****

PART-A (22 Marks)

1.	a)	Distinguish between incremental fuel rate and heat rate.	[4]
	b)	Compare short term and long term hydro-thermal scheduling.	[3]
	c)	What is spinning reverse?	[3]
	d)	Explain the significance of area control error.	[4]
	e)	List the merits of PI controller in load frequency control.	[4]
	f)	Write an expression for voltage drop in terms of reactive power, line reactance	
		and voltage.	[4]

<u>**PART-B**</u> (3x16 = 48 Marks)

2.	a)	Derive the equation for optimal load sharing among n units in a power system by neglecting transmission losses	[8]
	b)	A constant 30MW supplied by two 150MW generators, 1 and 2 for which the respective incremental fuel costs are $dC_1/dP_1=0.1P1+20$, $dC_2/dP_2=0.2P2+25$. With P in MW and C in Rs/h. Determine (i) the most economical division of load between the generators (ii) the saving in Rs/day there by obtain compared to equal load sharing between the machines.	[8]
3.	a) b)	Mention the merits of operating hydro-thermal combinations. Derive the coordination equation for the optimal scheduling of hydrothermal interconnected power plants.	[8]
			[8]
4.	a)	Explain the problem of unit commitment. Discuss the constraints in solving the unit commitment problem.	[8]
	b)	What is priority list method of unit commitment? Explain it with an example.	[8]
5.	a)	Explain the concept of control area. Develop a state space representation of two area control system	[8]
	b)	Draw a neat sketch of a typical turbine speed-governing system and derive its block diagram representation	[8]
		block diagram representation.	[0]
6.	a)	Describe the combined operation of an load frequency control and economical dispatch control, with the help of block diagram.	[8]
	b)	Discuss about the basic requirements needed for control strategy in load frequency control.	[8]
7.	a)	Briefly explain the different methods of reactive power injection in the power system	[8]
	b)	With the help of block diagram explain the reactive power balance and its effects on system voltage	[0]
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