Enrolment No	
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GUJARAT TECHNOLOGICAL UNIVERSITY BE - SEMESTER-VII • EXAMINATION – WINTER 2013

Subject Code: 170901DateSubject Name: Interconnected Power SystemsTime: 10:30 TO 01:00TInstructions:T						Date: 26-11-2013				
						Total	Marks: 70			
		 Attempt all que Make suitable a Figures to the rit 	stions. ssumptions v ight indicate	wherever ne full marks.	cessary.					
Q.1	(a)	Write a short note on how black out occurs in a large size power system. 0								
•••	(b)	Give a list of methods to improve transient stability of a large size power system. 07						07		
Q.2	(a) (b)	 Describe the advantages of interconnections of power systems in details. Give comparison of GS method and NR method used for load flow studies of power systems 								
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	(b)	b) Write a short note on islanding of part of power system.								
Q.3	Q.3 (a) Discuss the algorithm of load flow solution using Newton-Raphson type of buses							10		
	(b)	Describe the conce	pt of steady	state stabili	ity in brief.			04		
	()									
Q.3	(a)	State the assumptions made for load flow studies and applications of load flow 0^{\prime} studies.						07		
	(b)	Table given below gives the information of a four bus transmission network with line 07								
		impedances. The shunt admittance at all the buses is assumed negligible. Form a suitable graph and find primitive admittance matrix and bus incidence matrix of the								
		Line bus to bus	D in pu	V in nu	Line bus to bus	D in nu	V in pu			
				0.15						
		1-2	0.05	0.15	2-4	0.1	0.5			
		2-3	0.1	0.5	J-T	0.03	0.15			
		$\omega^{-}J$	0.15	0.70	1	1	I			
Q.4	(a) (b)	Describe unit com Derive the express an arbitrary number	mitment in d ion for B-co er of loads th	etail. efficients ir rough a trai	n case of two generations of two generations of two generations and the second se	ating plant	s connected to	07 07		

OR

Q.4 (a) Explain the functions of load dispatch centre in detail.

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- (b) Describe the methods of voltage control adopted for large size power system in detail. 07
 Q.5 (a) Describe flat frequency control and selective frequency control used for controlling 07 frequency in power system.
 - (b) In a two-bus system, two power plants are connected by a transmission line. If 100 07 MW is transferred from plant 1 to the load connected at bus 2, a transmission loss of 10 MW is incurred. Find the required generation for each plant and the power received by load when the system λ is Rs 250/MWh. The incremental fuel costs of the two plants are given below:

$$\frac{dC_1}{dP_{G1}} = 0.02P_{G1} + 16.0 \frac{Rs}{MWh}$$
$$\frac{dC_2}{dP_{G2}} = 0.04P_{G2} + 20.0 \frac{Rs}{MWh}$$
OR

Q.5 (a) Discuss procedure for solving the swing equation using point by point method.

(b) A synchronous generator of reactance 1.2 pu is connected to an infinite bus bar (|V| = 1.0 pu) through transformers and a line of total reactance of 0.06 pu. The generator no load voltage is 1.2 pu and its inertia constant is H=4 MW-s/MVA. The resistance and machine damping may be assumed negligible. The system frequency is 50 Hz. Calculate the frequency of natural oscillations if the generator is loaded to (i) 50 % and (ii) 80 % of its maximum power limit.
