

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VII (NEW) - EXAMINATION – SUMMER 2018

Subject Code:2170901

Date:03/05/2018

Subject Name:Inter Connected Power System

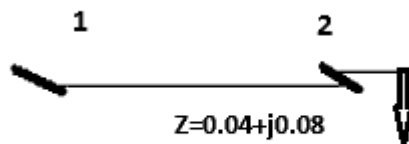
Time:02.30 PM to 05.00 PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		MARKS
Q.1	(a) State Advantages of interconnected power system.	03
	(b) Explain classification of power system Stability.	04
	(c) Explain need of load flow analysis, Derive static load flow equations.	07
Q.2	(a) List out any Three assumptions are be made for transient stability analysis.	03
	(b) Discuss steps of blackstart.	04
	(c) Explain equal area criteria for stability.	07
	OR	
	(c) Derive equation which shows characteristics of rotor of synchronous machine running as generator or motor.	07
Q.3	(a) Define Terms : a) Graph b) tree c) co tree.	03
	(b) Explain Jacobian Matrix related to N-R load flow Method.	04
	(c) Explain Tie line load bias control.	07
	OR	
Q.3	(a) State methods for Y _{BUS} formation.	03
	(b) In the equation $Y_{BUS} = A^T Y A$, Explain matrices Y and A with their dimensions	04
	(c) Describe generator model and load model in relation with frequency control	07
Q.4	(a) Write the property of Y-bus matrix.	03
	(b) Explain the following.	04
	(i) Bus incidence matrix	
	(ii) Primitive network	
	(c) For the system Shown below, Obtain V_2 and δ_2 after first iteration using GS method. Given, Bus 1 is slack bus $V_1 = 1$, $\delta_1 = 0$, Bus 2 is load bus with $P_2 + jQ_2 = -5 + j2$ pu	07



OR

Q.4	(a) Write main advantage of Fast D-Coupled method.	03
	(b) Give Four points of comparison G-S method and NR method for load flow analysis.	04
	(c) Write steps for formulating of Z bus. Explain Type 1 and Type 2 modification	07
Q.5	(a) Explain Incremental fuel cost and penalty factor with its equation	03
	(b) The fuel cost of two unit plants are given by :	04

$FC_1 = 100 + 2P_1 + 0.005 P_1^2$, $FC_2 = 200 + 2P_2 + 0.01 P_2^2$ where P_1 and P_2 in MW. Find economic load scheduling of two units to supply load of 480 MW and find incremental fuel cost, neglecting losses.

- (c) Explain unit commitment in detail 07
- OR**
- Q.5** (a) Draw Input –output curve and heat run curve of generating unit with proper label. 03
- (b) A synchronous generator of reactance 1.2 pu is connected to an infinite busbar ($|V|=1$ pu.) through transformers and a line of total reactance of 0.6 pu. The generator No load voltage is 1.20PU and its inertia constant is 4MW-s/MVA The resistance and machine damping assumed to be negligible. The system frequency is 50 Hz Calculate the frequency of natural oscillation If generator is loaded to 50%of its maximum power limit 04
- (c) Derive equation for B-coefficient. 07
