Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII EXAMINATION – SUMMER 2016

Subject Code:170901 Date:16/05/2016

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.**

Q.1 **(a)** Explain the G-S method for load flow study using flow chart **07**

(b) What is the importance of inter connected power system? Explain cascade tripping. **07**

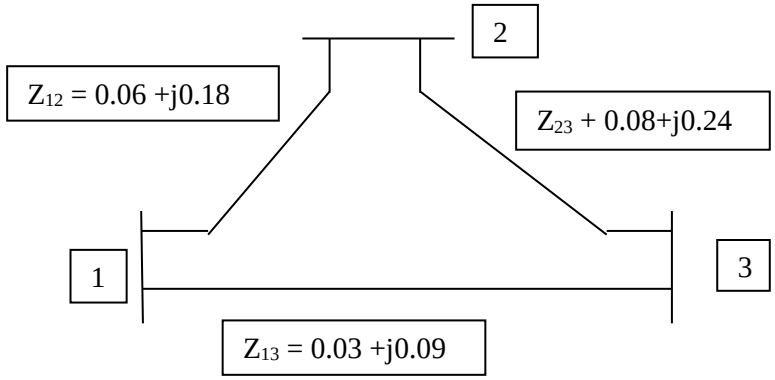
Q.2 **(a)** Explain the classification of buses. What is the significance of slack bus? Why slack bus related quantity does not enter into Jacobean Matrix? **07**

(b) Explain the approximate load flow with necessary assumption. **07**

OR

(b) Compare NR method with GS method of load flow study. **07**

Q.3 **(a)** Calculate Y-Bus for the following diagram. **07**



(b) Explain steps for modification of Z-bus when a link is added to the existing network. None of the bus is ground to which this link is connected. **07**

OR

Q.3 **(a)** The fuel cost of two unit plants are given by **07**

$C_1 = 100 + 2P_1 + 0.005\ P_1^2$

$C_2 = 200 + 2P_2 + 0.01\ P_2^2$ where P_1 and P_2 in MW. The plant supplies a load of 450 MW. Find economic load scheduling of two unit and find incremental fuel cost, neglecting losses.

(b) Explain automatic load dispatch in power system also explain the importance of regional load dispatch center. **07**

Q.4 **(a)** How can the transient stability of a system be improved? Discuss the traditional as well as new approaches to the problem **07**

(b) Explain the property of Y-bus matrix. **07**

OR

Q.4 **(a)** Explain the following. **07**

(i) Bus incidence matrix

(ii) Primitive network

(b) Explain the Unit commitment. **07**

Q.5 **(a)** Derive a mathematical model of turbine speed governing system. **07**

(b) A two pole 50 Hz , 60 MVA turbo generator has a moment of inertia of 9×10^3 kg-m^2. Calculate (i) the kinetic energy in MJ. (ii) Inertia constant M and H (iii)Inertia constant at 50 MVA. **07**

OR

Q.5 **(a)** Discuss the procedure for solving the swing equation using point by point method. **07**

(b) Derive the necessary equation for β-co-efficients. **07**

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