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GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2018****Subject Code: 2170901****Date: 26/11/2018****Subject Name: Inter Connected Power System****Time: 10:30 AM TO 01:00 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) What is the importance of interconnected power system? **03**
 - (b) Explain Cascade Tripping. **04**
 - (c) Discuss Zbus building algorithm. Explain all types of modifications when transmission lines are added between the buses. **07**

- Q.2**
- (a) Give reasons: Bus admittance matrix is a sparse Matrix. **03**
 - (b) Explain the following. **04**
 - 1) Bus Incidence matrix
 - 2) Primitive network
 - (c) 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.

OR

- (c) A constant load of 300 MW is supplied by two 200 MW generators 1 and 2, for which the respective incremental fuel cost are **07**
 $dC_1/dP_{G1} = 0.1 P_{G1} + 20$
 $dC_2/dP_{G2} = 0.12 P_{G2} + 15$
With Power P_G in MW and cost C in Rs/hr. Determine
 - 1) The most economical division of the load between the generators and
 - 2) The saving in Rs/day thereby obtained compared to equal sharing between the machines.
- Q.3**
- (a) Explain Properties of Y-bus matrix. **03**
 - (b) Write a Short Note on Unit Commitment. **04**
 - (c) State the assumptions made for load flow studies and applications of load flow studies. **07**

OR

- Q.3**
- (a) Explain the main features of Load Dispatch centre. **03**
 - (b) Define following : **04**
 - 1) Steady-state stability
 - 2) Transient stability
 - (c) Explain GS method with the help of flowchart. **07**
- Q.4**
- (a) What is critical clearing angle? **03**

- (b) Explain Incremental fuel cost and penalty factor with its equation. 04
- (c) State the methods of Load frequency control and explain bias tie line frequency control. 07
- OR**
- Q.4** (a) What is primitive network? 03
- (b) Draw the block diagram of AGC. 04
- (c) Describe the methods of voltage control adopted for large size power system in detail. 07
- Q.5** (a) What are the advantages of FDLF method over NR method? 03
- (b) Explain Power angle curve. 04
- (c) A 100 MVA, 2 pole, 60 Hz generator has a moment of inertia 50×10^3 kg. m³. 1) What is energy stored in the rotor at rated speed? 2) What is the corresponding angular momentum? 3) Determine the inertia constant H. 07
- OR**
- Q.5** (a) Classify various types of buses in power system for load flow analysis. 03
- (b) Explain Equal area criteria of stability. 04
- (c) Discuss in brief the methods for improving transient stability. 07

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