Seat No.:	Enrolment No
Jean 110.:	Emonient 10

**Subject Name: Advanced Power System – II (Deptt. Elective-II)** 

Subject Code:X80904

## **GUJARAT TECHNOLOGICAL UNIVERSITY**

PDDC - SEMESTER-VIII EXAMINATION - WINTER 2015

Date:04/12/2015

**Total Marks: 70** Time: 2:30pm to 5:00pm **Instructions:** 1. Attempt all questions. 2. Make suitable assumptions wherever necessary. 3. Figures to the right indicate full marks. (a) What is power system state estimation? Discuss Weighted Least Square 07 0.1 Estimation (WLSE) method with usual notations for power system state estimation. (b) Discuss voltage regulation in a transmission system and its relation with 07 reactive power with the help of necessary phasor diagram and expressions. A lossless three-phase 50 Hz transmission line has an inductive reactance of 07 **Q.2**  $0.6 \Omega$ /km while capacitive admittance is  $50 \mu$ S/km. If the system voltage at the sending is 220 kV (line-to-line) and the line length is 100 km, find (i) electrical line length of the line` (ii) surge impedance (iii) receiving end voltage at no-load with sending end voltage as reference (iv) the sending end current at no-load (v) reactive power at the sending end at no-load (vi) surge impedance loading (b) Explain  $\chi^2$  (chi-square) technique for bad data detection for power system state **07** estimation. **(b)** Discuss application of power system state estimation. **07** Q.3 What is power system security? Explain with the help of an example. 07 (a) (b) Explain different states of power system with their interrelations on diagram 07 showing condition of equality and inequality constrains. OR State different methods for heavily loaded and voltage stressed power systems 0.3 **07** to enhance voltage stability. Very briefly discuss one of them. (b) What is voltage collapse? State different changes in power system contributing **07** to the voltage collapse. (a) Discuss analytical concept of voltage stability for a two-bus system. 0.4 07 State the factors affecting voltage stability. **(b)** 07 Discuss briefly preventive and emergency control in power system. 07 0.4 (a) What is contingency analysis? Construct flow chart for contingency analysis **(b) 07** procedure in general. **Q.5** (a) Discuss extrapolation method of load forecasting. 07 (b) What is load forecasting? Discuss briefly correlation method of load 07 forecasting. OR What is vertically integrated utility? What are the reasons for initiating **Q.5 07** restructuring or deregulation of power system? **(b)** What is blackout? When can a blackout occur? 07

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