

GUJARAT TECHNOLOGICAL UNIVERSITY
B.E. - SEMESTER – VIII EXAMINATION – OCTOBER 2012

Subject code: 180906**Date: 25/10/2012****Subject Name: Advanced Power system- II****Time: 02.30pm - 05.00pm****Total Marks: 70****Instructions:**

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

- Q.1** (a) Describe Least Square Estimation (LSE) and Weighted LSE for estimation of x (vector of n random variables) using another vector y of variables m ($>n$). **07**
 (b) Describe power system operating states with the help of a neat figure. **07**
- Q.2** (a) For a 2-bus power system with a transmission line, derive expression of voltage regulation. Draw corresponding phasor diagram and with the help of the phasor diagram show that there is strong relationship between reactive power flowing through the line and the voltage drop along the line. **07**
 (b) Derive the expression of critical voltage and critical angle at receiving end at voltage stability limit. **07**
- OR**
- (b) Explain transition from an alert state to an emergency state of a power system with the help of suitable example of small power system. **07**
- Q.3** (a) Introduce load forecasting by a short note on it. **07**
 (b) Explain load forecasting methodology and estimation of average and trend terms. **07**
- OR**
- Q.3** (a) What is voltage stability? Explain different type of voltage stability. **07**
 (b) What is voltage collapse? State main factors that contributes to the phenomena of voltage collapse. **07**
- Q.4** (a) Introduce power system security by a short note on it. **07**
 (b) Discuss sensitivity factors used in security analysis. **07**
- OR**
- Q.4** (a) Write a short note on application of power system state estimation. **04**
 (b) Explain static and dynamic state estimation of power system. **03**
 (c) Discuss power system restoration after a black out. **07**
- Q.5** (a) Discuss vertically integrated utility in brief. **07**
 (b) Write a short note on Indian scenario of power systems and Electricity Act, 2003. **07**
- OR**
- Q.5** (a) Describe structure of deregulated power systems in India. **07**
 (b) Derive expression of mid-point voltage of a transmission line in terms of real power flow and line length. **07**
