

GUJARAT TECHNOLOGICAL UNIVERSITY**BE SEM-VIII Examination May 2012****Subject code: 180906****Subject Name: Advanced Power System II (Department Elective - II)****Date: 08/05/2012****Time: 10.30 am – 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) Describe Least Square Estimate (LSE) and weighted LSE for estimation of x vector of n variable using another vector y of variable m where $m > n$. **07**
- (b) Explain various applications of state estimations in a power systems **07**

- Q.2** (a) Explain what is power system security? **07**
- (b) Explain transition from an alert state to an emergency state of power systems of operation using a suitable example. **07**

OR

- (b) Describe the various operating states of power systems **07**

- Q.3** (a) What is voltage stability? Explain different types of voltage stability **07**
- (b) What is reactive power compensation? Explain reactive power compensation of radial transmission line for; (1). On no load and (2). Heavy loading condition. **07**

OR

- Q.3** (a) What is voltage collapse? Explain the main factors that contribute the phenomena of voltage collapse. **07**
- (b) Derive the expression of critical voltage and critical angle at receiving end at voltage stability limit for two bus system. **07**

- Q.4** (a) Describe process of restoration after a black out. **07**
- (b) Discuss the sources of reactive power generation in the power systems. **07**

OR

- Q.4** (a) Write short note on load forecasting. **07**
- (b) Explain load forecasting methodology and estimation of average and trend terms. **07**

- Q.5** (a) For a transmission line connected between two buses, derive the expression of voltage regulation and also prove from the phasor diagram that the Q and V have a strong coupling. **07**
- (b) Describe structure of deregulated (restructured) power industry. **07**

OR

- Q.5** (a) Describe structure of vertically integrated utility in brief **07**
- (b) Write a short note on Indian scenario of power industry and electricity act 2003. **07**
