07

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VIII EXAMINATION - WINTER 2015

Subject Code:180906 Date:12/12/2015

Subject Name: Advanced Power System- II

Time: 2:30pm to 5:00pm 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 state estimation? Describe the injection algorithm 07 for static state estimation of power system
 - **(b)** What is power system security? Explain major three **07** function of a power system security and system state classification.
- Q.2 (a) Derive the expression for critical receiving end voltage and critical power angle at voltage stability limit for a two bus power system.
 - **(b)** What are the compensating devices used for the **07** improvement of voltage stability? How do they work?

OR

- (b) Explain effect of On Load tap changer transformer on **07** voltage stability.
- Q.3 (a) Estimate two values random variables x by weighted least of square estimate method for a given measurement vector 'Y', weighted matrix 'W', and coefficient matrix 'H'.

$$Y = \begin{bmatrix} 0.5 \\ 0.45 \\ 0.51 \end{bmatrix}, \ W = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}, \ \ H = \begin{bmatrix} 1 & 1 \\ 1 & 0 \\ 0 & 1 \end{bmatrix}$$

(b) Write in detail about Electricity Act 2003.

OR

- Q.3 (a) A lossless three phase 50Hz transmission line has inductive 07 reactance of 0.60 Ω /km while capacitive admittance of 50 μ S/km. If the system voltage at the sending end is 220KV(L-L) and the line length is 100 km., find
 - 1)the electrical line length of line
 - 2)the surge impendence of the line
 - 3)the receiving end voltage at no load with sending end voltage as reference
 - 4)the sending end current
 - 5)the reactive power at sending end
 - 6)the surge impedance loading
 - (b) Explain operating states and nature of control action in a **07** power system?

Q.4	(a)	Explain uncompensated radial transmission line under	07
		heavy loading condition.	
	(b)	What is load forecasting? Describe the methods of load	07
		forecasting in power system.	
		OR	
Q.4	(a)	Write in detail about black out in power system.	07
Q.4	(b)	What is vertically integrated utilities? Explain in brief the	07
		factors which leads to change in a traditional power system.	
Q.5	(a)	What are the disturbances which contribute to voltage	07
		collapse? Define voltage stability and explain how it differs from rotor angle stability.	
	(b)	•	07
	(D)	OR	U/
0.5	(a)	_	07
Q.5	(a)	What are bad data measurements? How they are processed in state estimation process.	07
	(b)	Derive the expression for estimation of average and trend	07
		terms of deterministic part of load in load forecasting	
		method	
