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Code No.: 7122 M

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
M.E. I Year (EEE) I-Semester (Make Up) Examinations, March-2016
(Power Systems & Power Electronics)

Application of Power Electronics to Power Systems

Time: 3 hours

Max. Marks: 70

Note: Answer ALL questions in Part-A and any FIVE questions from Part-B

Part-A (10 X 2=20 Marks)

1. List the benefits of FACTS controllers.
2. List the various limitations of Present transmission network.
3. Describe the objectives of shunt compensation.
4. Explain the concept of Power oscillation Damping.
5. Explain the basic operating principle of Thyristor controlled series capacitor (TCSC).
6. How to improve the transient stability by using series compensation? Explain in brief.
7. Explain basic operating principle of Unified power flow controller.
8. Sketch the block diagram of shunt VSC controller of UPFC.
9. Explain the differences between Active and Passive filters.
10. Why harmonics are harmful to the system?

Part - B (5 X 10=50 Marks)
(All bits carry equal marks)

11. (a) List the various factors that limit the loading capabilities of transmission line and explain.
(b) Write short notes on different types of FACTS controllers.
12. (a) Derive Transfer function and explain dynamic performance of Static VAR compensation.
(b) Explain the effect of shunt compensation at the end of a radial line on voltage stability.
13. (a) Describe the operating principle of static series synchronous compensator with neat block diagram.
(b) Analyze the performance characteristics of TSSC.
14. (a) Illustrate the conventional transmission control capabilities of the UPFC through Phasor Diagram.
(b) Explain, How UPFC is employed to control real and reactive power flow independently?
15. (a) Define the following power system quantities (i) Voltage Sag (ii) Voltage swell (iii) voltage Noise (iv) Displacement Power factor (v) Distortion factor
(b) Explain the following (i) Harmonic sources from commercial loads (ii) Harmonic sources from industrial loads.
16. (a) List the applications of FACTS controllers and explain.
(b) Define the regulation slope. Explain with V-I characteristics of the SVC and STATCOM.
17. (a) Explain the operation of GTO Thyristor-controlled series capacitor.
(b). Derive the active and reactive power equations and draw the power angle characteristics of a two machine model interconnected power system.
