

M.Tech. Electrical Power System (CBCS Pattern) Semester-I
PEPS12 - Application of Power Electronics in Power System

P. Pages : 1

Time : Three Hours



GUG/S/25/10970

Max. Marks : 70

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- Notes :
1. Attempt **any five** questions
 2. All questions carry equal marks.
 3. Due credit will be given to neatness and adequate dimensions.
 4. Assume suitable data wherever necessary.
 5. Illustrate your answers wherever necessary with the help of neat sketches.
 6. Use of slide rule, Logarithmic tables, Steam tables, Mollier's chart, Drawing instruments, Thermodynamic tables for moist air, Psychrometric charts and Refrigeration charts is permitted.
 7. Use of non-programmable Calculator is permitted.

1. a) Derive the equation of active and reactive power flow in a simple two machine system. 7
b) Why there is a need of Interconnection in electrical power system and what are the problems with interconnection. 7
2. a) Write a short note on the basic types of FACTS controllers. 7
b) Explain the analysis of transient stability using Modified Euler's Method. 7
3. a) Explain the working principle of SSSC for two machine system with phasor diagram. 7
b) Explain how the shunt compensation increases the power flow capacity of transmission line. 7
4. a) A thyristor controlled inductor used in a static VAR compensation circuit in a 11kV, 50Hz ac network has inductance of 5H. Find the range of adjustable VAR using the inductor. 7
b) Draw V-I characteristics and loss characteristics of SSSC and hence explain merits of SSSC. 7
5. a) Draw the diagram showing implementation of UPQC by back to back voltage sourced converter in transmission line. 7
b) Discuss the role of voltage source converter in STATCOM for reactive power control. 7
6. a) Explain the basic configuration of DVR. State the main design factors influencing the rating. 7
b) Write short note on Interline Power Flow Controller (IPFC). 7
7. a) Explain step by step what are the various essential controls that are required for the stable operation of HVDC link. 7
b) Compare Right Shunt UPQC characteristics with left shunt UPQC characteristics. 7
8. a) Prove that the power delivered by mono-polar DC system is one and half times that of a single phase AC system, presuming that the AC line and DC line are employing the same conductors and insulators. 7
b) Describe individual phase control Scheme and equidistant pulse control of an HVDC Systems. List some of the drawbacks of individual phase control. 7
