

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

P. Pages : 1

Time : Three Hours



**GUG/S/23/10970**

Max. Marks : 70

- Notes :
1. All questions carry equal marks.
  2. Due credit will be given to neatness and adequate dimensions.
  3. Assume suitable data wherever necessary.
  4. Illustrate your answers wherever necessary with the help of neat sketches.
  5. 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.
  6. Answer **five** questions.
  7. Use of non-programmable calculator is permitted.

1. a) Why there is a need of interconnection in electrical power system and what are the problems with interconnection. 7  
b) Explain the term stability limits related to transmission of power. 7
2. a) What are the possible benefits of FACTS technology. 7  
b) Write a short note on the basic types of FACTS controllers. 7
3. a) Explain improvement of transient stability using static series compensator. 7  
b) Explain how does the shunt compensation increase the power flow capacity of transmission line. 7
4. a) Why transient free switching of TSC is needed? How it is achieved? 7  
b) Draw V-I characteristics and loss characteristics of SSSC and hence explain merits of SSSC. 7
5. a) Discuss the role of voltage source converter in STATCOM for reactive power control. 7  
b) Explain the functional control scheme of STATCOM. 7
6. a) Explain in brief working of UPFC as 7  
    i) Voltage regulator  
    ii) Line impedance compensator  
    iii) Power angle regulator.  
b) Write short note on interline power flow controller (IPFC). 7
7. a) Write a note on dynamic performance of UPFC. 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

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