

Thapar University, Patiala

Electrical & Instrumentation Engg. Department

EE-026 Flexible AC Transmission Systems

Mid Semester Test, Jan-June 2009

Duration : Two hours
Instructor : Dr. Sanjay K. Jain

Marks = 50

All questions are compulsory. Attempt all questions in precise and brief manner.

1. The operation of three-phase VSC can be explained by applying principle of superposition to the operation of one-phase leg. Explain the operation of one-phase leg and obtain the Fourier series of output voltage. Also calculate THD. (10)
2. Deduce the equivalent circuit of the thyristor based CSC. (10)
3. What is mid-point. Why the shunt compensation is attempted always at mid-point. (5)
4. Discuss the transient stability enhancement in two machine system by series compensation. (5)
5. Compare the converted based FACTS and thyristor based FACTS. (5)
6. Give a short answer for the followings -
 - (a) The CSC is the dual of VSC. The voltage of VSC consists triplen harmonics but the current waveform of CSC does not contain. Explain.
 - (b) Why the anti-parallel diodes are used with turn-off controllable devices in VSC.
 - (c) What is the purpose of capacitors on AC side of CSC realized using turn-off controllable devices.
 - (d) why the STATCOM is regarded as ideal synchronous condenser.
 - (e) summarize the characteristics of ideal controllable switch. (5*3)