Total Number of Pages: 02   **B.Tech**
                                                                                           PEEE5409

7th Semester Regular / Back Examination 2016-17
FLEXIBLE AC TRANSMISSION SYSTEM
BRANCH: EEE, EE
Time: 3 Hours
Max Marks: 70
Q.CODE: Y267
Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1   **Answer the following questions:**   **(2 x 10)**
   a) What are the conventional methods used for compensation in power systems?
   b) Differentiate between SSG and SVC.
   c) State the objectives of voltage and phase angle regulators.
   d) What is MOV? Explain how it is used in FACTs devices?
   e) Mention the best locations of compensator in two machine transmission system and in a simple radial line.
   f) Which types of converters are generally used in FACTS devices. Explain its significance.
   g) Give a basic two-converter scheme for IPFC.
   h) Draw the circuit diagram of TSC and explain each component.
   i) Power oscillation can be damped in better way by shunt or series compensator. Justify your answer.
   j) What do you mean by PLL? What is the role of PLL in FACTs controllers.

Q2 **a)** What is the effect of injected voltage in quadrature with the line current on the control of power flow? Explain with Phasor diagram.   **(5)**

   b) Explain how a VSC can be operated as a rectifier or inverter by controlling the valve conduction sequence.   **(5)**

Q3 **a)** Describe the principle of FC-TCR SVC with appropriate control scheme.   **(5)**

   b) Why transient free switching of TSC is needed and how it is achieved?   **(5)**

Q4 **a)** Explain what do you mean by Variable Impedance type and Switching Converter type FACTS devices. **(5)**

b) Draw V-I Characteristics and loss characteristics for: **(5)**
ii) TCSC
iii) SSSC

Q5 **a)** How an UPFC scheme can be implemented using two back to back voltage source converters. Explain with neat diagram. **(6)**

b) What are the objectives of shunt compensation? **(4)**

Q6 **a)** How voltage stability at load bus can be achieved using series compensation. **(5)**

b) In order to control both active & reactive power flow explain how to inject a voltage in series with line? **(5)**

Q7 Explain the working principle & V – I char. Of STATCOM? **(10)**

Q8 **a)** With the help of power angle curve explain how transient stability is improved with the help of series controllers. **(6)**

b) How TCBR. is used to improve the transient stability. **(4)**