

**Flexible AC Transmission Systems****(Power System and Control Automation)****Date: 29-07-2025****Time: 3 Hours.****Max. Marks: 70****Answer ONE Question from each UNIT and each question carries 14 Marks****UNIT-1**

1. Explain the loading capability limits and what is relative importance of controllable parameters [14M, CO1, Understand]

**[OR]**

2. (a) Analyze the relative importance of controllable parameters of the transmission system [7M, CO1, Analyze]  
(b) Explain the loading capability limits of transmission interconnection. [7M, CO1, Understand]

**UNIT-2**

3. (a) Sketch the three phase full wave bridge converter with turn-off devices [7M, CO2, Understand]  
(b) Explain the operation of three phase full wave bridge converter with relevant waveforms. [7M, CO2, Understand]

**[OR]**

4. Derive the expressions for fundamental and harmonic voltages of a three phase bridge converter. [14M, CO2, Analyze]

**UNIT-3**

5. Explain the following with respect to shunt compensation  
a) Mid-point voltage regulation. b) Transient stability. [14M, CO3, Understand]  
**[OR]**  
6. "For a radial line, the end of the line is the best location for compensation." Justify. Also explain how midpoint voltage regulation helps in increasing transmittable power of a line. [14M, CO3, Analyze]

**UNIT-4**

7. (a) Explain in detail the difference between Shunt and Series Compensations. [7M, CO4, Understand]  
(b) Explain about basic GTO -controlled series capacitor with principle of operation and necessary waveforms [7M, CO4, Understand]

**[OR]**

8. (a) Explain in detail the basic operating control schemes for Thyristor switched series capacitor [7M, CO4, Understand]  
(b) Determine how do you improvement of transient stability and power oscillation damping using static series compensation. [7M, CO4, Analyze]

**UNIT-5**

9. Discuss the Principle and operation of Unified Power Flow Controller with necessary diagrams and its characteristics [14M, CO5, Understand]

**[OR]**

10. Explain the Control Structure of Interline Power Flow Controller. [14M, CO5, Understand]

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