

Elective - I : Flexible AC Transmission Systems

P. Pages : 2

NJR/KS/18/4602

Time : Three Hours

0244

Max. Marks : 80

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- Notes :
1. All questions carry marks as indicated.
 2. Solve Question 1 OR Questions No. 2.
 3. Solve Question 3 OR Questions No. 4.
 4. Solve Question 5 OR Questions No. 6.
 5. Solve Question 7 OR Questions No. 8.
 6. Solve Question 9 OR Questions No. 10.
 7. Solve Question 11 OR Questions No. 12.
 8. Due credit will be given to neatness and adequate dimensions.
 9. Assume suitable data whenever necessary.
 10. Illustrate your answers whenever necessary with the help of neat sketches.

- 1.** a) Explain in brief different types of FACTS controller? **6**
- b) Explain the relative importance of controllable parameters of power flow control through transmission line. **7**

OR

- 2.** a) Describe factors affecting loading capability of transmission system. **6**
- b) Derive the expression of Active as well as reactive power flow in loss less transmission line? **7**
- 3.** a) Why there is a need of 3-level voltage source converter? Explain its working with suitable circuit diagram & waveform. **7**
- b) Compare voltage source Inverter and current source Inverter. **6**

OR

- 4.** a) Explain the working of six pulse voltage source converter by suitable diagram and waveforms. **7**
- b) Explain in brief about PWM controlled converter with suitable diagram. **6**
- 5.** a) Explain how shunt compensation improve the transient stability and prevent voltage instability of the power system. **7**
- b) Explain the working of TSC. State two conditions for transient free operation of TSC. **7**

OR

- 6.** a) Explain the operation of TCR with the help of circuit diagram, waveform and V-I characteristics. State the condition of TCR becoming TSR. **7**

- b) What is STATCOM? Draw circuit diagram and explain basic operating principle and V-I characteristic. **7**
- 7.** a) Discuss the objectives of series compensation. **7**
- b) Explain GTO controlled series controller (GCSC) and explain how it is dual to TCR. **6**
- OR**
- 8.** a) Explain the working of TSSC in detail. **6**
- b) Explain the working of SSSC in detail. **7**
- 9.** a) Explain the basic operation of voltage regulator and phase angle regulator. **7**
- b) Explain the operation of continuously controllable thyristor tap changer on Inductive load. **7**
- OR**
- 10.** a) Discuss about Hybrid phase angle regulator. **7**
- b) Explain switching convertor based voltage and phase angle regulator in brief. **7**
- 11.** a) Write note on JPFC. **6**
- b) Explain thyristor controlled braking resistor. **7**
- OR**
- 12.** a) Explain the operating principle of UPFC. **7**
- b) Explain NGH-SSR damping scheme. **6**
