

**Elective - I : Flexible AC Transmission Systems**

P. Pages : 2

**NRT/KS/19/3547**

Time : Three Hours

\*0254\*

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.
  11. Use of non programmable calculator is permitted.

**1.** a) Derive the expression for active as well as reactive power flow in lossless transmission line. **7**

b) What are advantages of FACTS technology. **6**

**OR**

**2.** a) List Basic types of FACTS controller and their symbols. **7**

b) Explain how FACTS and HVDC can be used as complimentary techniques. **6**

**3.** a) Explain single phase voltage source converter [VSC] in detail. **7**

b) Discuss in detail Generalized technique of harmonic elimination in VSC. **7**

**OR**

**4.** a) What is PWM converter? What are its advantages? **7**

b) Explain how voltage source converters are preferred over current source converters. **7**

**5.** a) Explain the role of mid point voltage support in short compensation. **7**

b) Write a short note on comparison of SVC and STATCOM. **6**

**OR**

**6.** a) Explain the working of ISC. **7**

b) Compare performances of TSC-TCR. **6**

**7.** a) Explain the concept of series compensation. **7**

b) Explain improvement of transient stability using series compensator. **7**

**OR**

**8.** a) Explain Static Series Synchronous Converter (SSSC). **7**

b) Explain duality between GCSC and TCR. **7**

**9.** a) Explain the operation of continuously controlled thyristor top changer with inductive load. **7**

b) Differentiate between voltage and phase angle regulator. **6**

**OR**

**10.** a) Explain the operation of continuously controlled thyristor top changer with capacitive load. **7**

b) Explain the working of voltage regulator. **6**

**11.** a) Explain reactive power compensation using UPFC. **7**

b) Explain NGH-SSR damping Scheme for mitigation of SSR problem. **6**

**OR**

**12.** a) Explain basic Scheme of Interline power flow controller. **7**

b) Explain why present transmission system with capacitive series compensation is prone to SSR. **6**

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