



Regulation R17

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A' Grade)

Subject code: 1E8BC

**B.Tech IV Year II Semester Supplementary Examinations, June 2022**

**Flexible AC Transmission System**

(Electrical and Electronics Engineering)

**Maximum Marks: 70**

Date: 17.06.2022 Duration: 3 hours

- Note:
1. This question paper contains two parts A and B.
  2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
  3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
  4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks

- 1 Define the term FACTS? (10x2M=20 Marks)
- 2 Write the list of stability issues that limits the transmission capability.
- 3 Give the advantages of 12-pulse converter.
- 4 What is pulse width modulation converter?
- 5 Write the three important objectives of shunt compensation.
- 6 List different methods of controllable VAR generation
- 7 Why static compensator not used as perfect voltage regulator?
- 8 What are the advantages of thyristor switched capacitors
- 9 Why series compensation is more effective than shunt compensation?
- 10 What is the use of interline power flow controller?

Part-B

Answer All the following questions.

- 11 Discuss the various categories of FACTS controllers in brief. (5X10M=50Marks)  
10M
- OR
- 12 A. Explain the basic types of FACTS controllers with diagrams. 5M  
B. Discuss the technical benefits from FACTS controllers. 5M
- 13 Explain the three phase full-wave bridge converter with necessary waveforms. 10M
- OR
- 14 Explain the principle of a voltage sourced converter. Why voltage sourced converters are preferred than current sourced converters for FACTS application? 10M
- 15 With a neat circuit diagram and necessary waveforms, discuss the operation of a Thyristor Controlled Reactor (TCR). Also represent their V-I operating area. 10M
- OR
- 16 A. Write a comparison between thyristor-controlled reactor and thyristor switched reactor. 5M  
B. Explain the power oscillation damping in shunt compensation. 5M
- 17 Discuss the operation of STATCOM with a neat diagram and characteristics. 10M
- OR
- 18 Write a comparison between STATCOM and SVC in the following :  
(i) V-I characteristics (ii) transient stability. 5M + 5M
- 19 Discuss improvement of transient stability using series compensation on transmission systems. 10M
- OR
- 20 Explain the working of thyristor controlled series capacitor (TCSC). Draw and discuss their V-I operating characteristics in voltage control mode and reactance control mode. Also discuss the applications of TCSC. 10M