R20 Regulation *Subject code:3E7BC*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VII Semester Supplementary Examinations, May 2026

FLEXIBLE AC TRANSMISSION SYSTEMS

(EEE)

Maximum Marks: 70 Date: 07.05.2026 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.
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 (10X2M=20 Marks)		Marks	CO	BTL
1	What are the objectives of FACTS controllers?	2M	1	L1
2	Why in general voltage sourced converters is preferred over current sourced converters in FACTS controllers?	2M	1	L1
3	Write the three important objectives of shunt compensation.	2M	2	L1
4	Discuss the sources of reactive power.	2M	2	L1
5	Draw the V-I characteristic of the SVC?	2M	3	L1
6	What are the advantages of thyristor switched capacitors?	2M	3	L1
7	What are the objectives of series compensation?	2M	4	L1
8	Explain different losses that are encountered with FC – TCR arrangement.	2M	4	L1
9	Explain main objectives and usefulness of UPFC in power industry	2M	5	L1
10	List merits of Hybrid compensator.	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	Explain the single phase full-wave bridge Voltage Source Converter operation with diagram and waveforms.	10M	1	L2
	OR			
12	Explain prevention of voltage stability with the help of end of line voltage support.	10M	1	L2
13	What is the need for reactive power compensation in transmission systems? Explain.	10M	2	L2
	OR			
14	Explain all Series Connected Controllers with neat diagram.	10M	2	L2
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	3	L2
	OR			
16	Explain the operation of STATCOM with an aid of block diagram.	10M	3	L2

17	Explain the voltage stability enhancement and power oscillation damping with series capacitive compensation.	10M	4	L2
	OR			
18	Explain with a neat sketch and waveforms the GSC type of series controller.	10M	4	L2
19	Explain the implementation of the UPFC by back-to-back voltage sourced converters.	10M	5	L2
	OR			
20	Explain the interline power flow controller (IPFC) voltage source converters.	10M	5	L2