R20 Regulation *Subject code: 3E7BC*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VII Semester Supplementary Examinations, October 2026

FLEXIBLE AC TRANSMISSION SYSTEMS

(EEE)

Maximum Marks: 70 Date: 28.10.2026 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 Second-Generation FACTS Controllers?	2M	1	L1
2	What are the factors which limit loading capability?	2M	1	L1
3	Which types of converters are generally used in FACTS devices.	2M	2	L1
4	What are the characteristics of TCSC?	2M	2	L1
5	What are the advantages of slope in SVC dynamic characteristics?	2M	3	L1
6	Draw the V-I characteristic of the STATCOM	2M	3	L1
7	What are the objectives of series compensation?	2M	4	L1
8	What are the conventional methods used for compensation in power systems?	2M	4	L1
9	What is the basic operating principle of an UPFC.	2M	5	L1
10	How UPFC is different than a simple VSC	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	Why electrical transmission systems are interconnected? Explain.	10M	1	L2
	OR			
12	What are voltages sourced converters? Why voltage sourced converters are preferred for FACTS application.	10M	1	L2
13	Explain the power oscillation damping with shunt compensation.	10M	2	L2
	OR			
14	Explain all Shunt Connected Controllers with neat diagram.	10M	2	L2
15	Explain the functional control scheme for Thyristor Switched Capacitor – Thyristor Switched Reactor (TSC–TCR) with a neat diagram. Also draw the loss versus output characteristics of TSC-TCR.	10M	3	L2
	OR			
16	Emphasize features of thyristor-controlled reactor.	10M	3	L2

17	Explain the improvement of transient stability using series compensation on transmission systems.	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	What is interline power flow controller? With a schematic diagram, explain its working.	10M	5	L2