Register No : _____

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2025

Fifth Semester

Electrical and Electronics Engineering

EE3004 – HVDC and FACTS

Regulations - 2021

Duration : 3 Hrs ***Maximum : 100 Marks***

PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)

Q.No	*Questions*	*BLT*	*CO*	*Marks*
1.	List the limits of line loading capability.	L1	1	2
2.	Compare AC and DC systems.	L2	1	2
3.	Summarize the various configurations of SVC.	L1	2	2
4.	List the various Auxiliary signals for TCSC modulation.	L1	2	2
5.	Define STATCOM.	L1	3	2
6.	Mention the applications of SSSC.	L1	3	2
7.	Define firing angle.	L1	4	2
8.	Why is the Gratz bridge commonly used in rectifier circuits?	L2	4	2
9.	List the four quadrants of operation in an inverter.	L1	5	2
10.	What is VSC-based HVDC transmission?	L1	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

Q.No		*Questions*	*BLT*	*CO*	*Marks*
11.	a	Explain the effect of shunt and series compensation on power transmission capacity of transmission line.	L2	1	16
		Or			
	b	Discuss the need for High Voltage Direct Current transmission in modern power systems. List out the advantages and applications of HVDC transmission.	L2	1	16
12.	a	Describe the working principle of the two types of Static VAR Compensator with neat schematic diagrams	L2	2	16
		Or			
	b	Explain the different modes of operation of TCSC.	L2	2	16
13.	a	Explain with a neat sketch, the operating principle, V-I characteristic & application of static synchronous compensator.	L2	3	16
		Or			

	b	Explain the different operating modes of SSSC for real and reactive power exchange.	L2	3	16
14.	a	Explain the operation of a Gratz bridge rectifier circuit along its working principles and applications.	L2	4	16
		Or			
	b	Describe the Constant Current (CC) and Constant Ignition Angle (CIA) modes of operation in HVDC transmission systems. Compare their applications and control methods.	L2	4	16
15.	a	Describe the basic operation of a 2-level IGBT inverter and its applications.	L2	5	16
		Or			
	b	Discuss the control of power flow in VSC-based HVDC transmission systems.	L2	5	16