

THE KAVERY ENGINEERING COLLEGE
(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV /DEC 2024

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.	Summarize the types of HVDC transmission system.	RE	1	2
2.	List out the factors to be considered for DC transmission systems.	UN	1	2
3.	Distinguish between TSC & FC.	RE	2	2
4.	State the characteristics differences between TSSC and TCSC.	UN	2	2
5.	Draw the schematic diagram of STATCOM.	RE	3	2
6.	List the parameters of the transmission line that can be controlled by UPFC?	UN	3	2
7.	Define pulse number.	RE	4	2
8.	Explain the role of smoothing reactor in a DC link	RE	4	2
9.	State the principle of phase-angle control.	RE	5	2
10.	What are the different types of MTDC systems?	RE	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*13 = 65)

Q.No	Questions	BLT	CO	Marks
11.	a Give the comparison between AC and DC Transmission and explain the factors in detail?	UN	1	13
	Or			
	b Draw the typical layout of HVDC transmission system and explain each part.	UN	1	13
12.	a Discuss in detail about the operation of the SVC (FC + TSR) and derive the equations used. Also explain how the SVC is able to regulate the HVAC bus voltage.	AP	2	13
	Or			
	b Explain the concept and different modes of operation of TCSC.	AP	2	13
13.	a Enumerate the operating features of STATCOM and draw its V-I characteristics curve.	UN	3	13
	Or			
	b Discuss the basic principle of operation of UPFC with relevant diagrams and its applications.	UN	3	13

14.	a	With the help of neat schematic diagram explain the operation of 3-phase, 6 pulse graetz's circuit?	AP	4	13
		Or			
	b	Explain in detail about the mode of operation and control of power flow CC and CIA mode of operation.	AP	4	13
15.	a	Explain the principle of IGPT and explain basic 2 level IGBT inverter operation with relevant output waveforms.	UN	5	13
		Or			
	b	Explain the phase angle control and dq control for 2 level inverter with corresponding diagram.	UN	5	13

*PART – C (Marks 1*15 = 15)*

<i>Q.No</i>		<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
16.	a	Justify the importance of MTDC system for transmission of large amount of power in grid.	AP	5	15
		Or			
	b	Explain the operation of SSSC and derive the expression for power flow through the line when it is compensated with SSSC.	AP	3	15