



## Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025

### FACTS and HVDC Transmission

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.  
2. M : Marks , L: Bloom's level , C: Course outcomes.*

Module – 1			M	L	C
Q.1	a.	Explain the basic types of FACTS controllers, with neat sketch.	10	L1	CO1
	b.	Discuss the power flow and dynamic stability considerations of a transmission interconnection.	10	L1	CO1
OR					
Q.2	a.	Enumerate the relative importance of controllable parameters.	10	L1	CO1
	b.	Discuss in detail possible benefits of FACTS technology also justify in perspective HVDC or FACTS.	10	L1	CO1
Module – 2					
Q.3	a.	With the help of a two machine system, explain how shunt compensation can help in improving transient stability.	10	L2	CO2
	b.	Describe the operation of TCR along with circuit and V – I characteristics.	10	L2	CO2
OR					
Q.4	a.	Explain with suitable diagram the switching converter type VAR generator.	10	L2	CO2
	b.	Explain with suitable sketch, the single phase operation of Thyristor Switched Reactor (TSR).	10	L2	CO2
Module – 3					
Q.5	a.	Describe important objectives of series compensation, also explain the concept of series capacitive compensation with neat sketch.	10	L2	CO3
	b.	Explain the operation of Static Synchronous Series Compensation (SSSC) with the help of suitable sketch.	10	L2	CO3
OR					
Q.6	a.	Discuss the improvement of transient stability in series compensated line with the help of equal area criterion.	10	L2	CO3
	b.	With a neat sketch explain the working of [TSSC] Thyristor Switched Series Capacitor.	10	L2	CO3
Module – 4					
Q.7	a.	Describe overview and organization of HVDC systems.	10	L3	CO4
	b.	State the advantages and application of HVDC systems.	10	L3	CO4
OR					
Q.8	a.	Draw the schematic diagram and explain the operation of 12-pulse converter.	10	L3	CO4
	b.	Explain the operation of 3-phase bridge converter with the help of circuit and waveforms.	10	L3	CO4
Module – 5					
Q.9	a.	Explain briefly desired features of HVDC control and also explain commutation failure.	10	L2	CO5
	b.	Describe the design of HVDC control.	10	L2	CO5
OR					
Q.10	a.	Enumerate five important control functions of a HVDC system and also explain voltage stability and reactive power.	10	L2	CO5
	b.	Explain : i) Individual Phase Control [IPC] ii) Equidistant Pulse Control [EPC].	10	L2	CO5

