

CBCS SCHEME

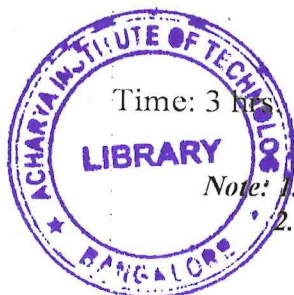
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BEE613C

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2026

FACTS and HVDC Transmission



Time: 3 hrs

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.		7	L2	CO1
	b.	Write about the power flow in an AC system.		7	L1	CO1
	c.	Illustrate the relative importance of controllable parameters.		6	L3	CO1
OR						
Q.2	a.	List the possible benefits from FACTS technology.		6	L1	CO1
	b.	Explain the limitations on transmission line landing capability.		6	L2	CO1
	c.	Discuss the power flow and dynamic stability considerations of a transmission inter connection.		8	L3	CO1
Module – 2						
Q.3	a.	Describe the operation of TCR along with circuit and V-I characteristics.		8	L3	CO2
	b.	Define switching converter type Var generator. Explain the basic operating principles of converter type Var generator.		8	L2	CO2
	c.	What are the important objectives of shunt compensation?		4	L1	CO2
OR						
Q.4	a.	Explain the operation of TSC-TCR with the help of basic circuit model and V-I characteristics.		8	L2	CO2
	b.	With the help of a two-machine system, explain how shunt compensation can help in improving transient stability.		8	L1	CO2
	c.	Why voltage slope is provided in the V-I characteristics of SVC and STATCOM?		4	L1	CO2

Module – 3

Q.5	a.	With neat sketch, explain the concept of series capacitive compensation.	8	L3	CO3
	b.	Discuss the improvement of transient stability in series compensated line with the help of equal area criterion.	8	L2	CO3
	c.	Explain the working of TCSC with the neat sketches of circuit and V-I plot.	4	L2	CO3

OR

Q.6	a.	Explain with suitable sketch, how voltage stability of a radial system can be improved using static series compensation.	10	L2	CO2
	b.	Explain the operation of Static Synchronous Series Compensation (SSSC) with the help of suitable sketch.	10	L3	CO3

Module – 4

Q.7	a.	Draw the schematic diagram and explain the operation of 12-pulse converter.	10	L3	CO4
	b.	List the advantages of HVDC system.	5	L1	CO4
	c.	Mention the applications of HVDC system.	5	L2	CO4

OR

Q.8	a.	Describe the organization of HVDC systems.	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 the converter control for a HVDC system.	10	L3	CO5
	b.	Describe the concept of reactive power and voltage stability in HVDC system.	10	L2	CO5

OR

Q.10	a.	Describe the design of HVDC control.	10	L2	CO5
	b.	Explain about the communication failure in HVDC converter system.	6	L3	CO5
	c.	What are the functions of HVDC control?	4	L1	CO5

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