CBCS SCHEME

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BEE613C

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025
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.	Define "Facts Controller", list the opportunities for 'Facts' in detail.	06	L2	CO1
	b.	Explain the importance and read of transmission interconnections.	08	L2	CO1
	c.	Discuss the limitations on transmission line loading capability.	06	L2	CO2
		OR			
Q.2	a.	Discuss the power flow and dynamic stability considerations of a transmission interconnection.	06	L3	CO2
	b.	Describe the power flow in an AC system with a suitable diagram.	08	L4	CO2
	c.	Explain about the basic types of Facts controlling in detail.	06	L2	CO1
		Module – 2			
Q.3	a.	Illustrate how shunt compensation can help in improving transient stability with the help of two machine system ?	10	L4	CO2
	b.	Explain the operation of Fixed Capacitor thyristor controlled Reactor type static VAR Generator with a suitable diagram and plot its Demand versus output characteristics.	10	L2	CO2
		OR			
Q.4	a.	Compare the V – I and V – Q characteristics of STATCOM and SVC,	06	L2	CO2
	b.	Discuss in detail about the basic control approaches for VAR Generator.	08	L2	CO2
	c.	State the importance of voltage slope provided in V – I characteristics of SVC and STATcom.	06	L2	CO2
		Module – 3			
Q.5	a.	Explain the concept of series capacitive compensation with a neat sketch and list the objectives of series compensation.	10	L2	CO3
	b.	Illustrate how voltage stability of a rodial system can be improved using static series compensation with a neat diagram.	10	L3	CO3
		OR			
Q.6	a.	Explain the operation of Thyristor –switched series capacitor (T S S C) with a neat sketch also describe its V – I characteristics.	10	L2	CO3
	b.	Discuss in detail about Transmitted power versus Transmission angle characteristics of a static series synchronous compensator (S S S C)with a relevant graph.	10	L2	CO3
		Module – 4			
Q.7	a.	Explain the operation of three phase full bridge converter with a neat circuit diagram and waveform, also derive the expression for the average output and direct voltage 'Vd'.	10	L4	CO4
	b.	Describe the organization of HVDC systems in detail.	10	L2	CO4

		OR			
Q.8	**a.**	State the advantages and applications of HVDC transmission system.	**06**	**L1**	**CO4**
	b.	Define multi-terminal HVDC, also list the types of multi-terminal HVDC.	**06**	**L2**	**CO4**
	c.	Explain the operation of 12 pulse convector with a neat Circuit diagram and Waveform.	**08**	**L2**	**CO4**
		Module – 5			
Q.9	**a.**	Describe the important control functions of a HVDC system.	**06**	**L3**	**CO5**
	b.	Discuss in detail about " commutation failure" in HVDC converter system.	**06**	**L2**	**CO5**
	c.	Write a short note on : i) Reactive power ii) Voltage stability	**08**	**L1**	**CO5**
		OR			
Q.10	**a.**	Discuss in detail how reversal of power flow is achieved in a Line Commutated Thyristor convector with a help of control characteristics.	**10**	**L3**	**CO5**
	b.	Describe the design of HVDC control and also explain the convector control for a HVDC system.	**10**	**L4**	**CO5**

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