Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–VI EXAMINATION – WINTER 2025

Subject Code:3160921 Date:25-11-2025

Subject Name:HVDC Transmission Systems

Time:02:30 PM TO 05:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	List out applications of DC transmission.	**03**
	(b)	Explain types of DC links.	**04**
	(c)	Explain in brief Comparison of AC and DC Transmission (Economics, Technical Performance and Reliability).	**07**
Q.2	**(a)**	Explain Potential applications of MTDC Systems	**03**
	(b)	Explain Types of Multi-terminal HVDC Systems.	**04**
	(c)	With single line diagram Explain components of HVDC systems.	**07**
		OR	
	(c)	Explain control and Protection of MTDC systems.	**07**
Q.3	**(a)**	Explain Principles of DC Link control in LCC HVDC systems.	**03**
	(b)	Explain DC line faults in LCC systems.	**04**
	(c)	Explain in brief Configuration and operation of Line Commutated Converters (LCCs).	**07**
		OR	
Q.3	**(a)**	Explain applications of DC breakers.	**03**
	(b)	Explain function of DC line insulators in HVDC systems.	**04**
	(c)	Explain Reactive Power Control / AC voltage regulation using VSC.	**07**
Q.4	**(a)**	Principles of DC Link Control in a VSC based HVDC system	**03**
	(b)	Explain DC line faults in VSC systems.	**04**
	(c)	Explain in brief Configuration and operation of Voltage Source Converters (VSCs).	**07**
		OR	
Q.4	**(a)**	Explain Naturally Sampled PWM.	**03**
	(b)	Explain corona effects in DC line.	**04**
	(c)	Explain firing angle control of HVDC Converters and System.	**07**
Q.5	**(a)**	Explain Uniformly Sampled PWM	**03**
	(b)	Compare Active filters and Passive filters.	**04**
	(c)	Explain current and extinction angle control of HVDC Converters and System.	**07**
		OR	
Q.5	**(a)**	Explain basic principles of synchronous and asynchronous links.	**03**
	(b)	Explain classification of power system stability.	**04**
	(c)	Explain analysis of voltage stability in asynchronous AC-DC System.	**07**