Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – WINTER 2023

Subject Code:3160921 Date:13-12-2023

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 the application of DC Transmission.	**03**
	(b)	What are the Limitations of HVDC Transmission lines?	**04**
	(c)	Give Comparison of AC and DC Transmission.	**07**
Q.2	**(a)**	List out the Components of a HVDC system.	**03**
	(b)	Why Commutation is required in HVDC system?	**04**
	(c)	Explain Line Commutated Converter based HVDC Systems.	**07**
		OR	
	(c)	Explain Voltage Source Converter based HVDC Systems.	**07**
Q.3	**(a)**	What will be the Effect of Delaying the Firing Instant?	**03**
	(b)	What is commutation process in HVDC system?	**04**
	(c)	Explain Basic Principal of three-phase AC–DC Conversion, six pulse converter operation.	**07**
		OR	
Q.3	**(a)**	What is the Importance of Reactive power?	**03**
	(b)	What do you mean by Rectifier and Inverter operation?	**04**
	(c)	Explain Twelve Pulse Converters operation in detail.	**07**
Q.4	**(a)**	Write down only VSC Operating Principle.	**03**
	(b)	Explain Selective Harmonic Elimination	**04**
	(c)	Discuss PWM schemes in detail.	**07**
		OR	
Q.4	**(a)**	How Real and Reactive power control using a VSC?	**03**
	(b)	Explain Phase Lock Loop (PLL).	**04**
	(c)	Discuss Principles of DC Link Control in a VSC based HVDC system in detail.	**07**
Q.5	**(a)**	What is the role of Smoothing Reactors?	**03**
	(b)	Explain Corona effect in DC Line.	**04**
	(c)	Discuss Voltage Stability Problem in AC/DC systems.	**07**
		OR	
Q.5	**(a)**	Write down a Principle of Power modulation.	**03**
	(b)	List out the Types of Multi-terminal HVDC System.	**04**
	(c)	Write a short note on “Modern Trends in HVDC Technology.”	**07**

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