Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:3160921 Date:14-07-2023

Subject Name:HVDC Transmission Systems

Time:10:30 AM TO 01:00 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)**	Compare of AC and DC Transmission.	**03**
	(b)	Describe harmonic elimination techniques.	**04**
	(c)	Explain various types of HVDC systems.	**07**
Q.2	**(a)**	Describe Commutation Process.	**03**
	(b)	Explain six pulse converter with neat diagram.	**04**
	(c)	Explain twelve pulse converters.	**07**
		OR	
	(c)	Enlist components of HVDC transmission system and explain any two in details.	**07**
Q.3	**(a)**	Write short note on DC breaker.	**03**
	(b)	Write short note on “corona effect”.	**04**
	(c)	Explain power flow and dc voltage control in VSC based HVDC system.	**07**
		OR	
Q.3	**(a)**	Classify PWM techniques.	**03**
	(b)	List out various characteristic of Harmonics.	**04**
	(c)	Write short note on high level controllers.	**07**
Q.4	**(a)**	What is Current and Extinction Angle Control?	**03**
	(b)	Explain “Phase-Locked Loop”	**04**
	(c)	Explain in detail control of power in MTDC.	**07**
		OR	
Q.4	**(a)**	Write principles of DC Link Control in a VSC based HVDC system.	**03**
	(b)	With sketch explain Sinusoidal Pulse Width Modulation.	**04**
	(c)	Enlist different types of insulators. Explain all in short.	**07**
Q.5	**(a)**	Explain DC line faults in LCC systems.	**03**
	(b)	Describe voltage stability problem in AC/DC systems.	**04**
	(c)	Write short note on modular multilevel converter.	**07**
		OR	
Q.5	**(a)**	Differentiate between synchronous and asynchronous link.	**03**
	(b)	Explain Parallel Operation of HVDC.	**04**
	(c)	Explain mono-polar operation of HVDC.	**07**

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