Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER– VI EXAMINATION – SUMMER 2026

Subject Code:3160921 Date:01-06-2026

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 AC and DC transmission in view of economy.	**03**
	(b)	Write application of DC transmission.	**04**
	(c)	Explain analysis of the commutating circuit.	**07**
Q.2	**(a)**	Explain: 1) Peak Inverse Voltage (PIV) 2) Peak to peak Ripple Voltage (PPR)	**03**
	(b)	Determine the output DC voltage, peak to peak ripple and peak inverse voltage of 12- pulse converter given that the secondary side voltage of the converter transformer (line-to-line) is 200Kv(rms).	**04**
	(c)	Give the schematic diagram of HVDC link. What are the important components?	**07**
		OR	
	(c)	Give the schematic diagram of 12-pulse converter. What are the different conduction modes.	**07**
Q.3	**(a)**	Explain operating principal of Voltage Source Converter (VSC).	**03**
	(b)	Describe selective harmonics elimination technique.	**04**
	(c)	Classify PWM technique and Explain sinusoidal PWM in detail.	**07**
		OR	
Q.3	**(a)**	Explain the necessity of power control in HVDC link.	**03**
	(b)	Compare CSC (Classical HVDC) and HVDC – VSC system.	**04**
	(c)	With the help of a neat block diagram, explain the operation of constant current system and mention various requirement for the same.	**07**
Q.4	**(a)**	Explain mechanism of AC power transmission.	**03**
	(b)	Write a short note: Ground Electrodes	**04**
	(c)	State the different firing control scheme adopted for HVDC systems with neat sketches. Explain the difference in operation of each method.	**07**
		OR	
Q.4	**(a)**	Explain β control for rectifier in HVDC link.	**03**
	(b)	Explain control system hierarchy for HVDC converter with diagram.	**04**
	(c)	What are the characteristics and types of DC breaker. Also mention application of DC breaker.	**07**
Q.5	**(a)**	How is (a) Paralleling and (b) Deparalleling in MTDC system.	**03**
	(b)	Write types of MTDC (Multiterminal DC) system.	**04**
	(c)	Give classification of power system stability in brief.	**07**
		OR	
Q.5	**(a)**	Explain basic principle of Asynchronous link.	**03**
	(b)	Explain transient stability improvement using DC link control.	**04**
	(c)	Write comparison of series and parallel multiterminal HVDC system.	**07**

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