Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER – V • EXAMINATION – WINTER 2012

Subject code: X 50904 Date: 21/01/2013

Subject Name: Switch Gear

Time: 02.30 pm - 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.**

Q.1	**(a)**	Discuss the following term with reference to circuit breaking: 1) Symmetrical and Asymmetrical Breaking capacity 2) Making Capacity 3) Short time rating	**07**
	(b)	Explain the construction, principle of operation and application of a Minimum Oil circuit breaker(MOCB).	**07**
Q.2	**(a)**	Explain Slapain's Theory of arc interruption.	**07**
	(b)	What is current chopping? How can the effect of Current chopping be minimized?	**07**
		OR	
	(b)	Explain various methods of arc extinction in a circuit breaker.	**07**
Q.3	**(a)**	Explain the construction, working principle , merits and demerits of air break circuit breaker	**07**
	(b)	Explain the properties of SF6 gas in recent developments of circuit breaker.	**07**
		OR	
Q.3	**(a)**	Explain the construction, working principle , merits and demerits of air blast circuit breaker	**07**
	(b)	Explain the principle, construction of vacuum circuit breakers. Also state the merits of VCBs.	**07**
Q.4	**(a)**	With neat diagram explain the principle of synthetic testing of circuit breaker. State its advantages.	**07**
	(b)	Explain the duty of circuit breaker for capacitor bank or unloaded transmission line switching.	**07**
		OR	
Q.4	**(a)**	What is resistance switching? Prove, with derivation, that the restriking voltage can be reduced by incorporating resistance switching in an air blast circuit breaker.	**07**
Q.4	**(b)**	In a 132KV power system, the inductance per phase up to the location of the circuit breaker is 16mH and capacitance to earth is 0.02µF. Calculate the following when the circuit breaker opens: 1) Maximum value of restriking voltage. 2) Frequency of transient oscillations. 3) Maximum value of RRRV.	**07**
Q.5	**(a)**	Explain briefly the problems encountered in HVDC breakers.	**07**
	(b)	What is meant by Kilometric fault? Discuss the performance of circuit breaker when kilometric faults are interrupted.	**07**
		OR	
Q.5	**(a)**	What are the various methods of indirect testing? Describe unit testing.	**07**
	(b)	Explain capacitor switching duty of circuit breaker.	**07**

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