Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–V • EXAMINATION – WINTER 2013

Subject Code: X 50904 **Date: 11-12-2013**

Subject Name: Switchgear

Time: 10.30 AM - 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.**

Q.1	**(a)**	Explain a trip circuit for the automatic operation of circuit breaker on fault	**07**
	(b)	Define the following terms related to circuit breaking: (i) Total fault clearing time (ii) Break time (iii) Arcing time	**07**
Q.2	**(a)**	Explain the energy balance theory of arc interruption in a circuit breaker.	**07**
	(b)	What are the different methods of arc interruption in a circuit breaker? Explain high resistance interruption method.	**07**
		OR	
	(b)	Explain slepain's theory of arc interruption in a circuit breaker.	**07**
Q.3	**(a)**	Define and explain following characteristics of restriking voltage: (i) Amplitude factor (ii)First pole to clear factor (iii)RRRV	**07**
	(b)	Explain the phenomenon of current chopping and its effects on circuit interruption. What measures are taken to reduce it?	**07**
		OR	
Q.3	**(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**
	(b)	Discuss the following term with reference to circuit breaking: 1) Rated Breaking capacity 2) Rated Making capacity 3) Rated Operating Duty	**07**
Q.4	**(a)**	Explain the construction, working principle , merits and demerits of air break circuit breaker	**07**
	(b)	Explain the construction, working principle , merits and demerits of air blast circuit breaker	**07**
		OR	
Q.4	**(a)**	Explain the construction, working principle of Puffer type SF6 circuit breaker with neat diagram.	**07**
	(b)	Explain the construction, working principle , merits and demerits of minimum oil circuit breaker.	**07**
Q.5	**(a)**	With neat diagram explain the principle of synthetic testing of circuit breaker. State its advantages.	**07**
	(b)	Discuss the type of short circuit testing stations used for testing circuit breakers. Describe various equipments used in short circuit testing stations.	**07**
		OR	
Q.5	**(a)**	What are the various methods of indirect testing? Describe unit testing.	**07**
	(b)	Explain working principle, construction, applications of HVDC circuit breaker.	**07**

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