Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI • EXAMINATION – WINTER 2013

Subject Code: 162403 **Date: 02-12-2013**

Subject Name: Switchgear and Fault Analysis

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.**

Q.1	**(a)**	List the disadvantages of rewireable fuse. Explain the HRC Cartidge fuse. List advantages and disadvantages of HRC Cartidge fuse.	**07**
	(b)	List the advantages and limitations of static relay.	**07**
Q.2	**(a)**	Define fault. List and explain in brief various abnormal conditions in ac system. Explain the fault clearing process.	**07**
	(b)	Explain the rate of rise of TRV. Derive the equation for restriking voltage.	**07**
		OR	
	(b)	Explain the current interruption in ac circuit breakers. Draw the oscillogram of current and voltage during fault clearing.	**07**
Q.3	**(a)**	Define current chopping. Explain the interruption of low magnetizing current.	**07**
	(b)	Explain the construction and working of Single pressure puffer type SF_6 circuit breaker. List the advantages of SF_6 circuit breaker.	**07**
		OR	
Q.3	**(a)**	Define electric arc. List the methods of arc extinction and explain the high resistance interruption.	**07**
	(b)	Explain the construction and working of minimum oil circuit breaker. List the advantages and disadvantages of minimum oil circuit breaker.	**07**
Q.4	**(a)**	Derive the equation of current (complete solution) for sudden short circuit of R-L series circuit.	**07**
	(b)	Explain the single line to ground and double line to ground faults on unloaded generator.	**07**
		OR	
Q.4	**(a)**	A balanced star connected load takes 90 A from the balance 3-phase, 4-wire supply. If the fuses in the Y and B phases are removed, find the symmetrical components of the line currents.	**07**
	(b)	Write a technical note on “Induction Disc Relay”.	**07**
Q.5	**(a)**	Write a technical note on “Attracted Armature Relay”.	**07**
	(b)	List the characteristics of relays for over current protection. Draw the scheme for over current protection with three over current relays.	**07**
		OR	
Q.5	**(a)**	Explain the principle of circulating current differential protection. List the difficulties with it.	**07**
	(b)	Explain the directional impedance relay and its torque equation.	**07**

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