Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER– VII • EXAMINATION – SUMMER 2015

Subject Code:X70901 **Date: 08/05/2015**

Subject Name: Power System Protection

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)**	Explain the basic requirements of protective system.	**07**
	(b)	Why is back up protection required? Discuss different types of back-up protections used.	**07**
Q.2	**(a)**	Define the following terms. (i) Over reach (ii) Under reach (iii) Fault clearing time (iv) CT ratio error (v) CT phase angle error (vi)Unit protection (vii) Plug setting multiplier	**07**
	(b)	Explain the working of carrier aided under reach transfer tripping scheme using time-distance characteristic and control circuit.	**07**
		OR	
	(b)	Explain in detail the time-distance characteristics of three impedance relaying units used for the I, II and III zone of protection.	**07**
Q.3	**(a)**	Explain the faults in transformer. Explain the construction and working principle of Buchholz relay.	**07**
	(b)	Explain the negative phase sequence and field failure protection of Generator.	**07**
		OR	
Q.3	**(a)**	Explain the protection of large induction motor.	**07**
	(b)	Explain the method of protecting bus bars using differential relaying. What are the limitations of this method and to what extent can these be overcome.	**07**
Q.4	**(a)**	Draw the block diagram of a numerical relay and explain the working of each block.	**07**
	(b)	What is the difference between an earth fault relay and an over current relay? Discuss various methods to energize an earth fault relay.	**07**
		OR	
Q.4	**(a)**	Explain over fluxing protection of transformer.	**07**
	(b)	Give the comparison between FIR and IIR filter.	**07**
Q.5	**(a)**	Discuss the working principle of an induction relay and also derive an expression for the torque produced by it.	**07**
	(b)	Explain the installation and commissioning test of relays in brief.	**07**
		OR	
Q.5	**(a)**	Discuss a protective scheme for the protection of parallel feeders and ring main system.	**07**
	(b)	Which special tests are carried out on a relay? Explain any two of them.	**07**

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