Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – I • EXAMINATION – SUMMER • 2013

Subject code: 710707N **Date: 17-06-2013**

Subject Name: Modern Power System Protection

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)**	State the benefits of digital relays with reference to electromechanical, static and microprocessor based relays.	**07**
	(b)	What is LINKNET ? Draw flow chart for relay co-ordination and primary/backup relay pair	**07**
Q.2	**(a)**	Draw basic block dia. of digital relay. Also explain any one subsystem in detail.	**07**
	(b)	For the **figure 1** shown below, find out back up relays of primary relay 1 (R1) and relay 2(R2).	**07**

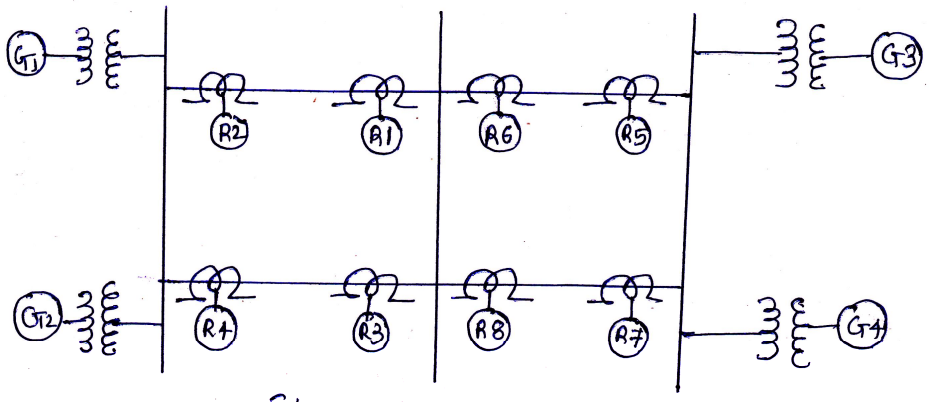

Figure 1 Q-2(B)

OR

	(b)	Explain Sampling theorem.	**07**
Q.3	**(a)**	Explain Working principle of Least Squares based method. Also explain Integral LSQ fit.	**07**
	(b)	Explain the concept of Adaptive relaying	**07**

OR

Q.3	**(a)**	Explain the method of full cycle algorithm and half cycle algorithm for phasor estimation. Give comparison between these two methods.	**07**
	(b)	Explain the precautions for automatic reclosing of circuit breakers.	**07**
Q.4	**(a)**	Explain briefly the criteria which must be considered during the design of Load-Shedding scheme.	**07**
	(b)	Explain the working of Induction Cylinder type frequency relay. Draw its characteristic for a typical operational delay of 6 cycles.	**07**

OR

Q.4	**(a)**	Explain briefly the Voltage and Angular synchronism check characteristics with respect to reclosing relay	**07**
	(b)	Write short note on One-Short Vs Multi-Short reclosing relay	**07**

Q.5	**(a)**	Explain the problems that occur during the protection of transmission line due to the presence of series capacitor.	**07**
	(b)	What is the apparent impedance seen by a distance relay during current inversion problem when series compensation is given at (i) the middle of the transmission line (ii) the end of the transmission	**07**

OR

Q.5	**(a)**	Explain the basic principle of relays based on Travelling waves.	**07**
	(b)	. Explain the concept of following technique with reference to relay algorithm(1)differential equation based technique (2)least square error based technique	**07**

****