Seat No.:	Enrolment No

Subject code: 710707N

GUJARAT TECHNOLOGICAL UNIVERSITY M. E. - SEMESTER – I • EXAMINATION – WINTER • 2014

Date: 05-12-2014

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) Draw the block diagram and explain various components involved in digital 07 signal processing for a numerical relay. (b) Explain Sampling Theorem with reference to Digital relay. 07 (a) What is Aliasing error? Also suggest various ways to remove it. 07 0.2 (b) Explain the method of full-cycle Fourier algorithm for phasor estimation. What 07 are its' advantages? OR With the help of flow charts explain the steps of the algorithm used to **07** determine the primary and backup relay. (a) Explain algorithm to prepare LINKNET structure and determine back up relay. 0.3 07 (b) Explain following terms with reference to Reclosing relay. 07 (1) Instantaneous-Trip Lockout. (2) Deionizing time for three-pole reclosing. (3) Selective reclosing. OR (a) Explain working principle of Least-Square based method. **Q.3 07** (b) Explain the criteria for deciding the number of load-shedding steps for a load 07 shedding scheme. Explain the working of digital frequency relay. Also explain the effect of **07** 0.4 (a) location on it. **(b)** What are GPS and WAMS? How are numerical relays adaptable to WAMS? **07** Explain the following problems that occur in the protection of transmission 07 0.4 lines due to the presence of series capacitors. Phase impedance unbalance (i) Transient phenomena (iii) Sub synchronous resonance **(b)** Explain considerations for application of instantaneous reclosing. 07 (a) Explain working of travelling wave based digital relay for internal and external Q.5 **07** (b) Write short note on One-Shot Vs Multi-Shot reclosing relay 07 (a) Explain the main aspects of automatic synchronizing. Q.5 07 Why does distance relay overreaches and underreaches in case of the 07 Protection of series compensated transmission lines?
