GUJARAT TECHNOLOGICAL UNIVERSITY
ME Semester –I Examination Feb. - 2012

Subject code: 710707N   **Date: 21/02/2012**
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.**

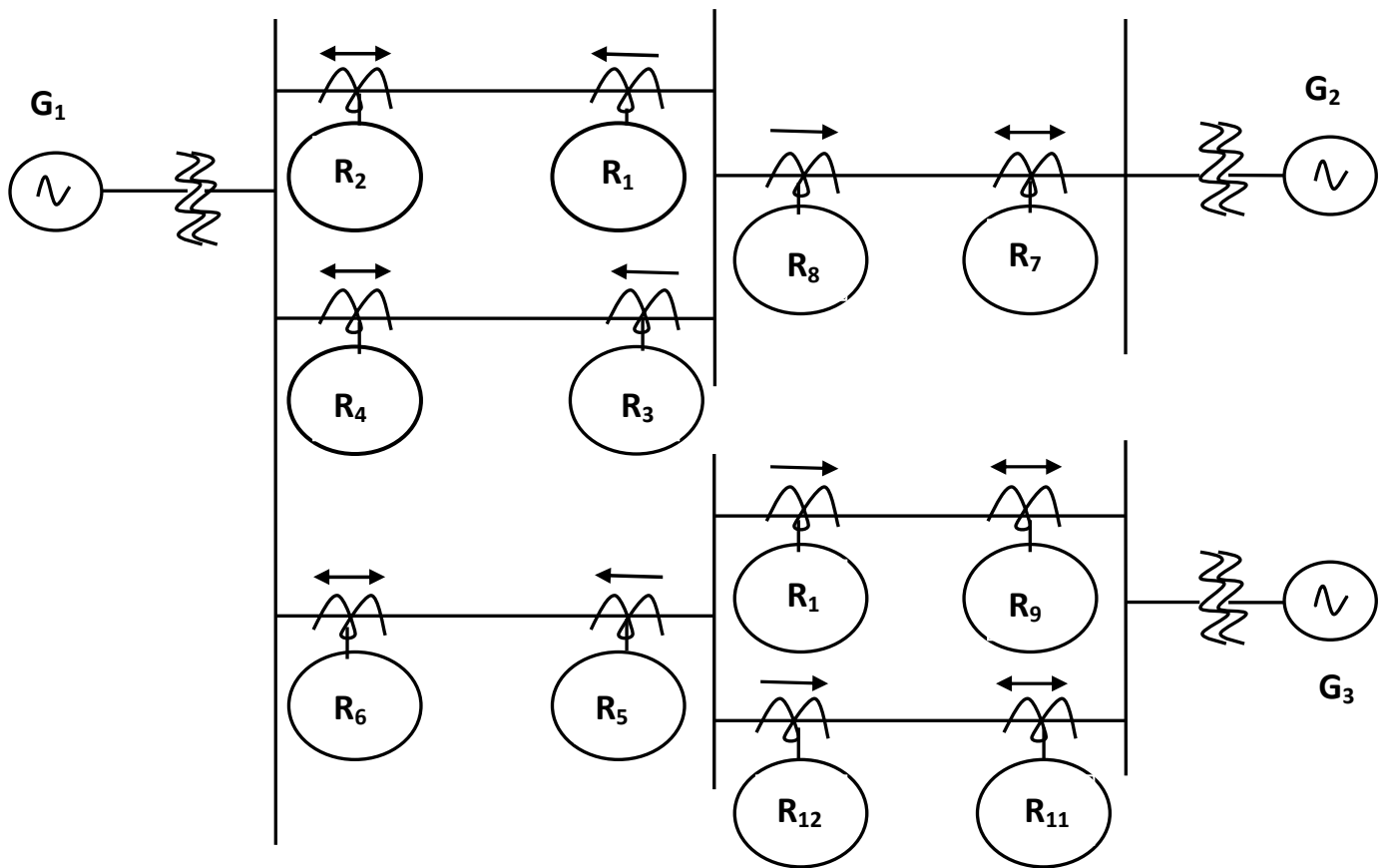|			
Q.1		**Fig. 1** shows single line diagram of power system network Using the flowchart of LINKNET structure, prepare a table indicating the values of Node, End, Next, List, and Far. Find out the backup relays of primary relays R1 and R10. Also draw flow charts used during this process.	**14**
Q.2	**(a)**	What is Aliasing error? Also explain the way to remove it.	**07**
	(b)	Explain following with respect to digital protection	**07**
		(1) Surge Protection (2) Sample and Hold Circuit	
		OR	
	(b)	Explain Sampling theorem.	**07**
Q.3	**(a)**	Explain briefly the criteria which must be considered during the design of Load-Shedding scheme.	**07**
	(b)	Explain the working of digital frequency relay. Also explain the effect of location of it.	**07**
		OR	
Q.3	**(a)**	Explain frequency response during Over load.	**07**
	(b)	Explain load shedding scheme for external fault.	**07**
Q.4	**(a)**	Explain the working of Single short solid state reclosing relay.	**07**
	(b)	Explain briefly the Voltage and Angular synchronism check characteristics with respect to reclosing relay	**07**
		OR	
Q.4	**(a)**	Explain following terms with reference to reclosing relay.	**07**
		(1) Instantaneous trip lockout. (2) Selective reclosing (3) Intermediate lockout	
	(b)	Write short not on One-Short Vs Multi-Short reclosing relay	**07**
Q.5	**(a)**	Explain with schematic diagram, the concept of Fourier analysis based Half cycle window algorithm.	**07**
	(b)	Explain following terms with reference to compensated transmission line protection. (1) The Degree of Compensation (2) Voltage profile of series compensated line.	**07**
		OR	
Q.5	**(a)**	Working principle of travelling wave based digital relay for internal and external fault.	**07**
	(b)	What is the apparent impedance seen by differential relay during the current inversion problem when series compensation given at middle and at the end of transmission line.	**07**

Fig. 1 Single line diagram of power system network