Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–VII • EXAMINATION – WINTER 2013

Subject Code: X 70902 **Date: 05-12-2013**

Subject Name: Interconnected Power System

Time: 10.30 am - 01.00 pm **Total Marks: 70**

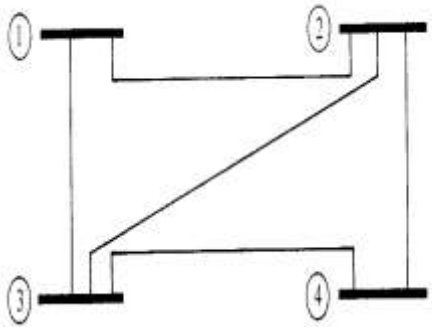
Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 (a) Derive Static Load Flow Equations (SLFE) from the first principle. Write it in the rectangular or polar form. **07**

(b) Explain the Method of formation of Ybus using singular transformation method **07**

Q.2 (a) A four bus system is shown in fig. each line has series impedance given in the table. The shunt admittance is neglected. Find [Y_{BUS}]. **07**



Line (bus to bus)	R, pu	X, pu
1–2	0.05	0.15
1–3	0.10	0.30
2–3	0.15	0.45
2–4	0.10	0.30
3–4	0.05	0.15

(b) Explain approximate load flow solution method with necessary assumptions **07**

OR

(b) Write notes on load dispatch centre's functioning **07**

Q.3 (a) Explain working of AGC with a neat block diagram. **07**

(b) Compare GS method of load flow study with NR method **07**

OR

Q.3 (a) What is incremental fuel cost? Give the algorithm(steps) for finding optimal loading of generators for system having k No. of generators in a plant **07**

(b) Explain the G S method for load flow steady. **07**

Q.4 (a) What is phase shifting transformer? Explain it use for power flow control with neat vector diagram. **07**

(b) Explain different methods of voltage control in a transmission systems **07**

OR

Q.4 (a) State the methods of Load Frequency Control and Explain bias tie line Frequency Control. **07**

(b) Derive expression for β coefficients (Loss co coefficients) for a sample system. Make necessary assumptions **07**

Q.5 (a) Discuss the methods of improving steady state stability **07**

(b) A 50 MVA, 11 KV, 50 Hz, 4 pole generator having an inertia constant H of 9 sec supplies 40 MW to large grid through a 50 MVA 11/220 KV transformer and a 220 KV transmission line. A three phase fault occurs on the line followed by a simultaneous opening of the CB on both sides. The breakers reclose 9 cycles after the initiation of the fault. Calculate the rotor **07**

angle and rotor velocity at the instant of re-closure. The rotor angle with respect to synchronous reference axis at the instant of fault was 20^0electrical. Neglect losses

OR

Q.5	**(a)**	What is Power system angle stability? Discuss steady state, Dynamic and Transient Stability in a power system.	**07**
	(b)	Explain Step by Step method for stability analysis	**07**

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