Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2024

Subject Code:3160920 Date:24-05-2024

Subject Name:Inter Connected Power System

Time:10:30 AM TO 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.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	What is Islanding?	**03**
	(b)	Discuss the significance of Load Dispatch Centre	**04**
	(c)	Form of Y- Bus using singular transformation technique. (Consider 0 bus as a ground)	**07**

From bus	To bus	X(pu)
0	1	0.2
0	2	0.2
1	2	0.1

Q.2	**(a)**	What is the purpose of load flow study?	**03**
	(b)	Discuss Static Load Flow Equations	**04**
	(c)	Discuss flow chart of N-R method used for load flow study	**07**

OR

	(c)	Discuss the comparison between different techniques used for load flow studies	**07**

Q.3	**(a)**	What is Booster Transformer? Discuss it as a tool for voltage control.	**03**
	(b)	Discuss tie line frequency control	**04**
	(c)	Discuss the modeling of speed governing system	**07**

OR

Q.3	**(a)**	Discuss Fixed Capacitor Thyristor Controlled Reactor as a tool for voltage control.	**03**
	(b)	Discuss Selective frequency control	**04**
	(c)	Two generating units rated for 130 MW and 220 MW has governor speed regulation of 6.0 and 4.0 percent from no-load to full-load, respectively. They are operating in parallel and sharing a load of 315 MW. Assuming free governor action, determine the load shared by each unit.	**07**
Q.4	**(a)**	Discuss Vertically Integrated Electricity Market	**03**
	(b)	What is Penalty factor considering unit commitment aspect?	**04**
	(c)	Discuss unit commitment using dynamic programing method	**07**

OR

Q.4	**(a)**	Discuss Power exchangers and spot pricing in power system in brief	**03**
	(b)	Discuss transmission loss formula	**04**
	(c)	In a power system, two units are connected in parallel. The incremental fuel cost for Gen-1 =0.02*(PG1) +10 Rs./MWh Gen-2= 0.03*(PG2) +20 Rs./MWh It has been observed that at optimal scheduling the units generated by Gen-1 and Gen-2 are 100MW (PG1=PG2=100 MW). If dPL/dPG2 =0.2, Find out the penalty factors of both the plants and dPL/dPG1	**07**
Q.5	**(a)**	What is power system stability? Classify the stability	**03**
	(b)	List out the assumptions to be considered for transient stability study.	**04**
	(c)	The two poles, 50 Hz, 11 kV turbo generator has a rating of 100 MW at 0.8 power facto. The moment of inertia of rotor is 11000 kg-m^2. Calculate Inertia constant (H) and Angular Momentum (M)	**07**

OR

Q.5	**(a)**	List out the methods to improve steady state stability	**03**
	(b)	Discuss the factors affecting transient stability limit.	**04**
	(c)	Discuss Point by point (considering swing equation) method to determine critical fault clearing time and angle.	**07**

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