U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

June 2025 Semester End Main Examinations

Programme: B.E. **Semester: VII**

Branch: Electrical and Electronics Engineering **Duration: 3 hrs.**

Course Code: 22EE7PCPSO **Max Marks: 100**

Course: Power System Operation and Control

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

			UNIT - I	*CO*	*PO*	Marks
1	a)		Explain different operating states of a power system with a block diagram.	*CO1*	*PO1*	**08**
	b)		Give the hierarchical structure of power system control centres.	*CO1*	*PO1*	**06**
	c)		Explain speed governing mechanism of a steam turbine with schematic diagram.	*CO1*	*PO1*	**06**
			OR			
2	a)		Discuss the concept of energy control centers and explain its functions.	*CO-1*	*PO1*	**08**
	b)		Define SCADA? Explain with a neat block diagram the monitoring and control process of SCADA.	*CO-1*	*PO1*	**06**
	c)		What is PMU? Explain its applications.	*CO-1*	*PO1*	**06**
			UNIT - II			
3	a)		Explain with relevant expressions of dynamic response of change in frequency for step change in load.	*CO-2*	*PO1*	**08**
	b)		Explain how load frequency is controlled in two area system.	*CO-2*	*PO1*	**06**
	c)		Explain the static response of ALFC system for single area system.	*CO-2*	*PO1*	**06**
			OR			
4	a)		Explain the modeling of Tie line in power systems.	*CO-2*	*PO1*	**08**
	b)		Derive the block diagram of ALFC of a two-area power system with supporting equations.	*CO-2*	*PO1*	**12**
			UNIT – III			
5	a)		Explain in detail about the generation and absorption of reactive power by various power system components.	*CO-2*	*PO1*	**10**

		b)	Explain voltage drop in transmission line.	*CO-2*	*PO1*	**10**
			OR			
	6	a)	Explain the importance of voltage control and list the methods of voltage control.	*CO-2*	*PO1*	**10**
		b)	Explain the working of Automatic voltage regulator with a neat schematic diagram and hence obtain the transfer function.	*CO-2*	*PO1*	**10**
			UNIT – IV			
	7	a)	What is Unit Commitment problem? Discuss the constraints in unit commitment.	*CO-3*	*PO1*	**12**
		b)	The following are data pertaining to three units in a plant. Unit 1: Max. = 600 MW, C_1= 5610 +79.2 P_1+ 0.01562 P_1^2 Rs/h Unit 2: Max. = 400 MW, C_2= 3100 +78.5 P_2+ 0.0194 P_2^2 Rs/h Unit 3: Max. = 200 MW, C_3= 936 +95.64 P_3+ 0.05784 P_3^2 Rs/h Obtain the priority list and commitment scheme.	*CO-3*	*PO2*	**08**
			OR			
	8	a)	Explain priority list methods in unit commitment. Also write its merits and demerits.	*CO-3*	*PO1*	**10**
		b)	Explain forward DP approach in unit commitment with flow chart.	*CO-3*	*PO4*	**10**
			UNIT – V			
	9	a)	Define system security? Explain in detail about its functions that are carried out in an operation control center.	*CO-3*	*PO1*	**08**
		b)	List the various power system security states and explain briefly.	*CO-3*	*PO1*	**06**
		c)	Explain the contingency analysis steps in system security	*CO-3*	*PO1*	**06**
			OR			
	10	a)	Explain the simplest form of contingency analysis technique with the help of flow chart.	*CO-3*	*PO1*	**08**
		b)	Write a note on: i. Generation shift distribution factor. ii. Line shift distribution factor.	*CO-3*	*PO1*	**12**

****