Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – MAY 2025

Date: 31-05-2025 **Time:** 09:30 am – 12:30 pm

School: SOE	**Program:** B.Tech. (EEE)	
Course Code : EEE3025	**Course Name:** Power System Operation and Control	
Semester: VI	**Max Marks:** 100	**Weightage:** 50%

CO - Levels	CO1	CO2	CO3	CO4	CO5
Marks	24	26	24	26	-

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks. **10Q x 2M=20M**

1.	State the functions of the energy control center?	**2 Marks**	**L1**	**CO1**
2.	Name the constraints in the unit commitment problem?	**2 Marks**	**L1**	**CO1**
3.	Describe the priority list method solution for unit commitment?	**2 Marks**	**L1**	**CO2**
4.	Outline the function of governor control in power system operation?	**2 Marks**	**L1**	**CO2**
5.	Define: i) Economic load dispatch and ii) frequency bias.	**2 Marks**	**L1**	**CO2**
6.	State the governor's dead band?	**2 Marks**	**L1**	**CO3**
7.	Mention the different issues to be addressed during the implementation of AGC in the power system?	**2 Marks**	**L1**	**CO3**
8.	Identify the significance of linear programming in economic load dispatch?	**2 Marks**	**L1**	**CO4**
9.	Outline the importance of composite generation production cost in load dispatch operation?	**2 Marks**	**L1**	**CO4**
10.	Tell how a take-or-pay fuel supply contract works between the two power customers.	**2 Marks**	**L1**	**CO4**

Part B

Answer the Questions. **Total Marks 80M**

11.	**a.**	Describe the Backward Dynamic Programming approach for the unit commitment problem with a neat diagram.	**10 Marks**	**L2**	**CO1**
	b.	Summarize the operating states of the power system with a block diagram.	**10 Marks**	**L2**	**CO1**
		Or			
12.	**a.**	Describe the operation of the Energy Control Centre in the energy management system with a block diagram.	**10 Marks**	**L2**	**CO1**
	b.	Explain the Forward Dynamic Programming approach for the unit commitment problem with a neat diagram.	**10 Marks**	**L2**	**CO1**

13.	**a.**	Describe the operation of the conventional fly ball speed governor system for steam flow?	**10 Marks**	**L2**	**CO2**
	b.	Summarize the load frequency and excitation control of a turbo generator with an appropriate diagram.	**10 Marks**	**L2**	**CO2**
		Or			
14.	**a.**	Explain the automatic load frequency control for the single area system with a neat block diagram.	**10 Marks**	**L2**	**CO2**
	b.	Summarize the basic generator control loop that has both automatic voltage regulator and load frequency control with a neat block diagram.	**10 Marks**	**L2**	**CO2**

15.	**a.**	Explain the state space analysis of an interconnected two-area system with a neat block diagram.	**10 Marks**	**L2**	**CO3**
	b.	Summarize the challenges and issues during the implementation of AGC in the power system.	**10 Marks**	**L2**	**CO3**
		Or			
16.	**a.**	Explain the state space model of a single-area ALFC system with a block diagram.	**10 Marks**	**L2**	**CO3**
	b.	Describe the static response of a two-area system for the uncontrolled case with a neat block diagram.	**10 Marks**	**L2**	**CO3**

17.	**a.**	Analyze power system fuel scheduling using the Linear Programming method with a neat flow chart.	**10 Marks**	**L4**	**CO4**
	b.	Examine the system when there is a Take-or-Pay Fuel Supply Contract between the two systems for the power system operation.	**10 Marks**	**L4**	**CO4**
		Or			
18.	**a.**	Debate the composite generation production cost function to address the economic load dispatch with appropriate assumptions.	**10 Marks**	**L4**	**CO4**
	b.	Analyze the economic load dispatch using the Gradient Search Optimization Technique in a power system with a neat flowchart.	**10 Marks**	**L4**	**CO4**