Register No : _____

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV/DEC 2025

Sixth Semester

Electrical and Electronics Engineering

EE3602 - Power System Operation and Control

Regulations - 2021

Duration : 3 Hrs *Maximum : 100 Marks*

*PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)*

Q.No	*Questions*	*BLT*	*CO*	*Marks*
1.	List out the requirements of a good power system.	L2	1	2
2.	State the different types of tariff.	L2	1	2
3.	What is area control error?	L1	2	2
4.	Define per unit droop.	L1	2	2
5.	What is a Static VAR Compensator?	L1	3	2
6.	Why is a stability compensator needed in the AVR loop?	L2	3	2
7.	List the equality and inequality constraints considered in the economic dispatch problem.	L2	4	2
8.	Draw the incremental cost curve of a thermal power plant.	L1	4	2
9.	What are the functions of control centre?	L1	5	2
10.	Mention the importance of state estimation in power system.	L2	5	2

*PART – B (ANSWER ALL QUESTIONS) (Marks 5*16= 80)*

Q.No			*Questions*	*BLT*	*CO*	*Marks*
11.	a		Explain in detail about plant level and system level control.	L3	1	16
			Or			
	b	i	Draw and explain the basic p-f and q-v control loops.	L3	1	8
		ii	Write short notes on load forecasting.	L3	1	8
12.	a		Develop the transfer function model and depict the block diagram for a single-area Load Frequency Control (LFC) system that incorporates a governor.	L3	2	16
			Or			
	b		What is tie-line bias control, and how is it used to manage power in a multi-area system? Explain with neat sketch.	L3	2	16
13.	a		Illustrate the block diagram of a typical excitation system and derive its transfer function model.	L3	3	16
			Or			
	b		Describe the various methods of voltage control with neat diagram.	L3	3	16

14.	a	Determine the economic generation schedules of three generating units in a power system to meet the system load of 925MW. The operating unit and cost function are given below: The operating limits: $250 \leq PG_1 \leq 450$ $200 \leq PG_2 \leq 350$ $125 \leq PG_3 \leq 225$ The cost function: $F_1(PG_1) = 0.0045\ PG_1^2 + 5.2\ PG_1 + 580$ $F_2(PG_2) = 0.0056\ PG_2^2 + 4.5\ PG_2 + 640$ $F_3(PG_3) = 0.0079\ PG_3^2 + 5.8\ PG_3 + 820$	L4	4	16
		Or			
	b	Obtain the priority list of unit commitment using full load average production cost for the given data Heat rate for unit 1: $H_1 = 510 + 7.2P_1 + 0.0014P_1^2$ Heat rate for unit 2: $H_2 = 310 + 7.85P_2 + 0.00194P_2^2$ Heatrateforunit3: $H_3 = 78 + 7.97P_3 + 0.00482P_3^2$	L4	4	16

Unit	Min(MW)	Max (MW)	Fuel Cost
1	150	600	1.1
2	100	400	1.3
3	50	200	1.2

15.	a	Explain the block diagram that illustrates the hardware configuration of a SCADA system used in power system operation.	L2	5	16
		Or			
	b	Discuss the various operating state transitions and control strategies in a power system with a neat sketch.	L2	5	16