Register No : _____

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV /DEC 2024

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.	What is diversity factor?	RE	1	2
2.	List the methods of load forecasting.	UN	1	2
3.	Define per unit droop.	RE	2	2
4.	Outline the benefits of multi area system.	UN	2	2
5.	What are the various functions of excitation system?	RE	3	2
6.	What is static VAR Compensator?	UN	3	2
7.	Write the base point and participation factor formula of a generating unit.	UN	4	2
8.	Distinguish between economic dispatch and unit commitment.	RE	4	2
9.	What are the major functions that are carried out in an operation control center?	RE	5	2
10.	What is state estimation?	UN	5	2

*PART – B (ANSWER ALL QUESTIONS) (Marks 5*13 = 65)*

Q.No			*Questions*	*BLT*	*CO*	*Marks*
11.	a	i	A generating station has the following daily load cycle. Time (Hrs) 0-6 6-10 10-12 12-16 16-20 20-24 Load (MW) 20 25 30 25 35 20 Draw the load curve and find: a) Maximum demand b) Units generated per day c) Average load d) Load factor.	RE	1	7
		ii	State the difference between P-f, and Q-v Control loops.	AN	1	6
			Or			
	b	i	Analyze the classification of loads and list out the important characteristics of various types of loads.	RE	1	7
		ii	List the basics of electrical energy tariff.	AN	1	6
12.	a	i	What are the parts of speed governor system? Explain each part with neat sketch.	RE	2	7
		ii	Give typical block diagram for a two-area system inter connected by tie line and explain each block.	UN	2	6
			Or			
	b	i	List the Single area system using block diagram and deduce the expression for the steady state response of the system.	RE	2	7
		ii	Explain about of tie-line bias control with neat sketch.	UN	2	6

13.	a	i	Draw the circuit diagram for a typical excitation system and derive the transfer function model. Also discuss the stability aspects of the AVR.	UN	3	7
		ii	Explain the stability compensation.	UN	3	6
			Or			
	b	i	Illustrate the performance of generation and absorption of reactive power.	AN	3	7
		ii	Explain the types of excitation systems.	RE	3	6
14.	a	i	Analyze the λ-iteration method for finding the solution of economic dispatch neglecting transmission losses.	AN	4	7
		ii	Explain about hydro thermal scheduling problem.	UN	4	6
			Or			
	b	i	A power plant has three units with the following cost characteristics: C1= 0.05PG12 + 23.5PG1+700 Rs/hr C2= 0.2PG22 + 20PG2+850 Rs/hr C3= 0.09PG32 + 18PG3+960 Rs/hr where PGi ' s are in MW. Maximum and minimum loading allowable on each unit are: 150 MW and 40MW.Find optimal scheduling for a load of 275 MW.	AN	4	7
		ii	Discuss the priority list method of finding solution for a unit commitment problem.	UN	4	6
15.	a	i	Explain the hardware components and functional aspects of SCADA using a fundamental block diagram.	RE	5	7
		ii	Illustrate the weighted least square state estimation problem.	AP	5	6
			Or			
	b	i	Explain the five operating states of a power system in the security perspective with an example.	UN	5	7
		ii	Summarize how bad data are detected, identified and suppressed in power system state estimation.	UN	5	6

*PART – C (Marks 1*15 = 15)*

Q.No			*Questions*	*BLT*	*CO*	*Marks*
16.	a	i	Illustrate plant level and system level controls.	UN	1	8
		ii	Explain the constraints that are accounted in unit commitment problem.	UN	4	7
	b	i	Explain the STATCOM.	UN	3	8
		ii	Mention the four types of SCADA system and its application area. Denote the hierarchical levels used in EMS.	UN	5	7