Register No : _____

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 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.	Draw the Load Curve and load duration curve.	L1	1	2
2.	Define Utilization Factor.	L1	1	2
3.	List out various needs of frequency regulation in power system.	L1	2	2
4.	Give two conditions for proper synchronizing of Alternators.	L2	2	2
5.	What is the need for compensator in the AVR loop?	L2	3	2
6.	Distinguish on-load and off -load tap changing transformers.	L2	3	2
7.	Define minimum up time.	L1	4	2
8.	State the objectives of Economic dispatch problem.	L2	4	2
9.	How energy control center plays the vital role in supplying reliable power to the consumer?	L2	5	2
10.	What are the different operating states that a power system can operate?	L1	5	2

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

Q.No			*Questions*	*BLT*	*CO*	*Marks*
11.	a	i	The Maximum demand on a generating station is 20 MW, a load factor of 75%, a plant capacity factor of 50% and a plant use factor of 80%. Calculate (i) Daily Energy Generated (ii) Reserve Capacity of the plant.	L3	1	8
		ii	Analyze the importance of load curve and explain how these curves with economic operation of power system?	L3	1	8
			Or			
	b	i	A Consumer has a connected load of 12 lamps each of 100w at his/her premises. Its load demand are as follows, From Midnight to 5 A.M----------200w 5 A.M to 6 P.M----------No Load 6 P.M to 7 P.M----------700w 7 P.M to 9 P.M----------1000w 9 P.M to Midnight----------500w Draw the Load Curve and Calculate (i) Demand Factor (ii) Average Load (iii) Load Factor (Obtain the Values of unit generated to make LF to be 1).	L3	1	8

	i i	Discuss the Power scenario in India and future trends in Indian grid	L3	1	8
12.	a	Analyze the influence of frequency on real power control. Obtain the speed governor block in load frequency control of single area system.	L2	2	16
		Or			
	b	Develop the transfer function model for two area system with dynamic response of the power system.	L2	2	16
13.	a	Develop the block diagram of the AVR control system and derive the Transfer function of each block.	L3	3	16
		Or			
	b i	Analyze how the stability compensator improves the dynamic behavior of the loop.	L3	3	8
	i i	Discuss the operation and features of STATCOM in power system.	L3	3	8
14.	a	There are three thermal generating units which can be committed to take the system load. The fuel cost data and generation operating unit data are given below: F1 = 392.7 + 5.544 P 1 + 0.001093 P 12 F2 = 217 + 5.495 P 2 + 0.001358 P 22 F3 = 65.5 + 6.695 P 3 + 0.004049 P P 1, P 2, P 3 in MW Generation limits: 150 ≤ P 1 ≤ 600 MW;100 ≤ P 2≤400; 50 ≤ P3≤ 200 MW Show the details of economic schedule and the total costs of operation for each feasible combination of units for the load level of 900.	L4	4	16
		Or			
	b	Obtain the priority list of unit commitment using full load average production cost for the given data: Heat rate of unit 1 H1=510+7.2PG1+0.00142PG12 MW/hr Heat rate of unit 2 H2=310+7.85PG2+0.00194PG22 MW/hr Heat rate of unit 3 H3=78+7.97PG3+0.00482PG32 MW/hr	L4	4	16

Unit	Min (MW)	Max (MW)	Fuel Cost (K)
1	150	600	1.1
2	100	400	1.0
3	50	200	1.2
PD=500 MW			

15.	a	What is Energy Control Centre? How monitoring and data acquisition of different parameters helps in operation of energy control centre?	L2	5	16
		Or			

b	Discuss the operations and functions of SCADA with neat diagram.	L2	5	16