

THE KAVERY ENGINEERING COLLEGE*(An Autonomous Institution)***M.E DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2025***Second Semester**Power Systems Engineering***PS4202/PPST2422 - Power System Dynamics***Regulations – 2021/2024***Duration : 3 Hrs****Maximum : 100 Marks****PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)**

Q.No	Questions	BLT	CO	Marks
1.	Define the direct and quadrature axes in a synchronous machine.	L2	1	2
2.	Recall the significance of mutual inductance in a synchronous machine.	L1	1	2
3.	Tell the primary elements of an excitation system in a synchronous machine.	L1	2	2
4.	List the special characteristics of a hydraulic turbine.	L1	2	2
5.	List the different classifications of stability in power systems.	L1	3	2
6.	What is Single-Machine Infinite Bus (SMIB) system, and why is it used for stability studies?	L1	3	2
7.	What is the function of an Automatic Voltage Regulator (AVR) in a thyristor excitation system?	L1	4	2
8.	Define a system state matrix and its significance in power system stability analysis.	L2	4	2
9.	Recall the purpose of a Power System Stabilizer (PSS) in power system dynamics.	L1	5	2
10.	Define washout in the context of a stabilizing signal in a PSS.	L2	5	2

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

Q.No	Questions	BLT	CO	Marks
11.	a Apply the dq0 transformation to a given synchronous machine and derive its voltage equations. Or	L3	1	16
	b Use per-unit representation and Park's transformation to analyze a practical synchronous machine circuit.	L3	1	16
12.	a Analyze the protective functions of an excitation system and their impact on generator performance. Or	L4	2	16
	b Compare and contrast the electrical analog and mathematical modeling of a hydraulic turbine.	L4	2	16
13.	a Analyze the relationship between eigenvalues, eigenvectors, and system stability. Or	L4	3	16
	b Analyze the influence of field flux variations on the stability of a	L4	3	16

		power system and suggest possible control measures.			
14.	a	Analyze the impact of an AVR on the overall stability of a power system, including its interaction with system dynamics.	L4	4	16
		Or			
	b	Compare and contrast the small-signal stability characteristics of single-machine and multi-machine systems.	L4	4	16
15.	a	Explain the working principle of a Power System Stabilizer (PSS) and its role in maintaining power system stability.	L2	5	16
		Or			
	b	Describe the process of excitation control design, including exciter gain and stabilizer limits.	L2	5	16