

THE KAVERY ENGINEERING COLLEGE*(An Autonomous Institution)***B.E / B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2025***Sixth Semester**Chemical Engineering***CH3651- Process Dynamics and Control****(Log-log and Semi log graph sheets to be supplied)***Regulations – 2021***Duration : 3 Hrs****Maximum : 100 Marks****PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)**

Q.No	Questions	BLT	CO	Marks
1.	Define transfer function.	L1	1	2
2.	State initial value theorem.	L1	1	2
3.	What is meant by transportation lag?	L1	2	2
4.	Explain the term linearization.	L2	2	2
5.	Compare servo and regulatory problems in control system.	L2	3	2
6.	Explain the term on - off control.	L2	3	2
7.	Define stability of a system.	L1	4	2
8.	Compare cross over frequency with corner frequency.	L2	4	2
9.	What is the function of reboiler in a distillation column?	L1	5	2
10.	Compare the advantages and disadvantages of ratio control.	L2	5	2

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

Q.No	Questions	BLT	CO	Marks
11.	a i Use the Laplace transform method to solve $y'' - 3y' + 2y = e^{3t}$ $y(0)=1$, $y'(0)=0$.	L3	1	10
	i Identify any best three properties of Laplace Transform with statement and proof.	L3	1	6
	Or			
	b Develop the standard input forcing functions with examples.	L3	1	16
12.	a Develop a transfer function for mercury thermometer and obtain the dynamic response for a change in the input variable.	L3	2	16
	Or			
	b Develop a transfer function for two tank interacting system.	L3	2	16

13.	a	i	Explain the servo problem and regulator problem with a neat sketch.	L2	3	8
		i	Discuss about positive feedback and negative feedback with sketch.	L2	3	8
		i				
			Or			
	b	i	With a neat sketch, explain the working principle of pneumatic controller.	L2	3	8
		i	Explain the working principle of final control element namely control valve.	L2	3	8
		i				
14.	a		Construct the Bode plot for the following open loop transfer function and determine the gain margin and phase margin. $G(S) H(S) = 1 / [S (S+2) (S+4)]$.	L3	4	16
			Or			
	b		Discuss in general about Nyquist plots and draw it for first and second order system.	L3	4	16
15.	a		Analyze the control strategies for a distillation column and heat exchanger and explain about difficulties in controlling the temperature in it.	L4	5	16
			Or			
	b		Compare the cascade controller with feed forward controller and explain with suitable examples.	L4	5	16