Reg. No.



## VI SEMESTER B.TECH. (CHEMICAL ENGINEERING) MAKE UP EXAMINATIONS, JUNE/JULY 2017

## SUBJECT: PROCESS DYNAMICS AND CONTROL [CHE3203]

## **REVISED CREDIT SYSTEM**

Time: 3 Hours

MAX. MARKS: 100

	Instructions to Candidates:	
	✤ Answer ALL questions.	
	<ul> <li>Use of graph sheet is permitted.</li> </ul>	
	<ul> <li>Missing data may be suitably assumed.</li> </ul>	
<b>1A.</b>	Describe the working principle of feedback control system configuration with 0	D6
	an example	
1B.	Distinguish between bounded and unbounded inputs. State their time domain <b>Q</b> and Laplace domain functions	<b>D6</b>
1C.	Solve the differential equation using Laplace transform	08
	$\frac{d^2T}{dt^2} + 5\frac{dT}{dt} + 6T = z(t) \text{ given } z(t) = 1:T(0) = 1; T^{I}(0) = 0.$	
2A	Thermometer having first order dynamics with time constant of 2 minutes, is 1	10
	placed in a temperature bath at 150 °C. After the thermometer reaches	
	steady state it is suddenly placed in a bath at 170 °C at t=0 and left for 3 $$	
	minutes. After which it is suddenly returned to the bath at 150 °C. Calculate	
	the thermometer reading at time $t=1$ and 5 minutes.	
2B.	Explain the characteristics of time delay system. Specify the transfer function 0	06
	model of time delay system and approximate with Pade's approximation.	
2C.	Distinguish between effective and inherent valve characteristics.	04
3A	Discuss the different conventional control algorithms in detail and how 1	10
	selection is made	
3B.	Determine the overall transfer $C(s)/R(s)$ for system shown in Fig. 3C. 1	10

