

Reg.No. _____



Karunya UNIVERSITY

(Karunya Institute of Technology & Sciences)
(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

End Semester Examination – Nov/Dec – 2016

Code : 14EI2009
Sub. Name : PROCESS DYNAMICS AND CONTROL

Semester : 2016-17 ODD
Duration : 3hrs
Max. marks : 100

ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)

Q. No.	Sub Div.	Questions	Course Outcome	Marks
1.	a.	Mention the need for mathematical modeling of a process and Obtain the mathematical modeling of an Interacting system.	CO1	10
	b.	Describe a simple thermal system in which incoming liquid is heated by the heater in the tank and going out with higher temperature. Develop first order transfer function of the thermal process	CO1	10
(OR)				
2.	a.	Develop the mathematical model for i. Mixing Process ii. Liquid-Level Process with Constant-flow Outlet	CO1	15
	b.	Write the characteristics of first order process modeling.	CO1	5
3.	a.	A liquid-level control system linearly converts a displacement of 2 to 3 m into a 4 to 20 mA control signal. A relay serves as the two-position controller to open and close the inlet valve. The relay closes at 12 mA and opens at 10 mA. Find (a) the relation between displacement level and current, and (b) the neutral zone or displacement gap in meters.	CO1	12
	b.	Mention the advantages and disadvantages of Proportional controller.	CO2	8
(OR)				
4.	a.	Why derivative control mode is called anticipatory control mode? Write a short note on the characteristics of derivative control mode.	CO2	15
	b.	Mention the disadvantages of derivative control mode.	CO2	5
5.	a.	Explain the various steps involved in the process reaction curve method of tuning of controllers.	CO2	10
	b.	How a controller is tuned based on $\frac{1}{4}$ decay ratio?	CO2	10
(OR)				
6.	a.	Brief about air-to-open and air- to-close valves.	CO3	5
	b.	Explain the following valve characteristics i. Quick opening valve ii. Equal percentage valve iii. Linear valve.	CO3	15
7.	a.	With neat diagram, explain the different configurations of ratio control scheme. Mention the applications of ratio control scheme in industries	CO3	10
	b.	Describe cascade control. Explain the purpose of cascade control for heat	CO3	1

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(OR)				
8.	a.	Explain the following protection systems using override control scheme, Boiler protection system and Compression protection system	CO3	15
	b.	Mention the applications of selective control scheme.	CO3	5
<u>Compulsory:</u>				
9.	a.	With neat diagram, describe the objective, components of distillation equipment in detail.	CO3	20

ALL THE BEST