

Name:

Reg. No:

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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

07 THRISSUR CLUSTER

SECOND SEMESTER M.TECH DEGREE EXAMINATION, April 2017

Chemical Engineering

(Process Control)

07CH 6104 Process Dynamics and control II

Max. Marks : 60

Duration: 3 Hours

Answer all six questions. Part 'a' of each question is compulsory.

Answer either part 'b' or part 'c' of each question

Q.no.	Module 1	Marks
1a	State the assumptions involved in steam jacketed kettle	4
	Answer b or c	
b	Derive the steam side transfer equations for the temperature control in a steam jacketed kettle	5
c	Derive the dynamics of a two plate bubble cap gas absorber	5
Q.no.	Module 2	Marks
2a	Differentiate the characteristics of distributed and lumped parameter systems	4
	Answer b or c	
b	Derive the expression for heat conduction into a solid	5
c	Show that the transportation lag as an inherently distributed parameter system.	5
Q.no.	Module 3	Marks
3a	Explain the control schemes for heat exchanger	4
	Answer b or c	
b	Briefly describe material balance control schemes for distillation control with neat	5

figures

- c Derive the dynamics of a steam heated heat exchanger 5

Q.no.	Module 4	Marks
4a	Describe any one case study in DCS	4

Answer b or c

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|---|---|---|
| b | Compare centralized control system with DCS | 5 |
| c | Describe DCS protocols and communication in DCS | 5 |

Q.no.	Module 5	Marks
5a	Write short note on SCADA	5

Answer b or c

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|---|--|---|
| b | Explain the basic principles of PLC controllers. | 7 |
| c | Explain fuzzy logic control with an example. | 7 |

Q.no.	Module 6	Marks
6a	Compare position form of algorithm with velocity form of PID algorithm	5

Answer b or c

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|---|---|---|
| b | Describe the stability of discrete type control system. | 7 |
| c | Find the closed loop response of a first order process under proportional digital control for servo problem and find offset | 7 |