

Name :
Reg No :

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**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
07 THRISSUR CLUSTER**

SECOND SEMESTER M.TECH. DEGREE EXAMINATION APRIL 2018

Chemical Engineering

Process Control

07CH 6104 PROCESS DYNAMICS AND CONTROL II

Time : 3 hours

Max.Marks: 60

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	Explain the steps involved in mathematical modelling with an example	4
Answer b or c		
b	Derive the closed loop 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

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| b | Briefly describe material balance control schemes for distillation control with neat figures | 5 |
| c | Derive the dynamics of a steam heated heat exchanger | 5 |

Q.no.	Module 4	Marks
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| 4a | Describe any one case study in DCS | 4 |
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Answer b or c

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| b | Describe the building blocks of DCS | 5 |
| c | Compare DCS with centralised control system | 5 |

Q.no.	Module 5	Marks
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| 5a | Write short note on SCADA | 5 |
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Answer b or c

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| b | Explain the basic principles of artificial neural networks. | 7 |
| c | Explain fuzzy logic control with an example. | 7 |

Q.no.	Module 6	Marks
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| 6a | Compare position form of algorithm with velocity form of PID algorithm | 5 |
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Answer b or c

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| b | Compare and contrast Dead beat algorithm with Dahlin's algorithm deriving each. | 7 |
| c | Find the closed loop response of a feedback control loop | 7 |