

Name :
Reg No :

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

THIRD SEMESTER M.TECH. DEGREE EXAMINATION DEC 2017

CHEMICAL ENGINEERING

PROCESS CONTROL

07CH7103 PROCESS MODELLING AND SIMULATION

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	What is the basic principle of parameter estimation?	4
	Answer b or c	
b	What are the uses of mathematical modelling?	5
c	Explain classification of modelling techniques.	5
Q.no.	Module 2	Marks
2a	Explain equations of state.	4
	Answer b or c	
b	Derive the heat balance equation of CSTR with heat removal.	5
c	Explain equilibrium equations and equations of chemical kinetics.	5
Q.no.	Module 3	Marks
3a	Derive the model of mixing vessel with irreversible reaction.	4
	Answer b or c	
b	Derive the model of steam jacketed vessel.	5
c	Derive the model of isothermal constant volume CSTR in series.	5

Q.no.	Module 4	Marks
4a	Write the model equations of multicomponent flash drum	4
Answer b or c		
b	Develop the model for multicomponent distillation column.	5
c	Develop the model for partial condenser.	5
Q.no.	Module 5	Marks
5a	Develop the model of pipeline gas flow.	5
Answer b or c		
b	Develop the model of jacketed tubular reactor.	7
c	Develop the model of co-current liquid liquid heat exchanger.	7
Q.no.	Module 6	Marks
6a	What is method of weighted residuals?	5
Answer b or c		
b	Write the algorithm for the simulation of CSTR in series.	7
c	Write the algorithm for the simulation of batch reactor with a reversible reaction.	7