Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Sixth Semester B.Tech Degree Regular and Supplementary Examination July 2021

Course Code: AE302

Course Name: PROCESS CONTROL

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks. Marks

1 a) Explain process degree of freedom with suitable example. (7)

b) What is period of oscillations in a process? Derive the period with an example. (5)

c) Explain steady state gain. (3)

2 a) Differentiate single capacity/ multicapacity process and interacting/non-interacting process with examples. (6)

b) Explain variable time constant and discuss how it can be used in a process design. (5)

c) Discuss process time constant with example. (4)

3 a) Analyze the temperature process and comment on the various time constants. (8)

b) Discuss different types of scaling with examples. (7)

PART B

Answer any two full questions, each carries 15 marks.

4 a) What are the process elements in a typical feedback control loop? Using these elements derive the closed loop transfer functions of the system. (10)

b) Explain dead zone and backlash. (5)

5 a) Derive feed forward controller algorithm and tuning using appropriate figure. (9)

b) Explain factors in feedback controller tuning. (6)

6 a) What is fine tuning? Discuss a method for fine tuning in feedback control. (7)

b) Explain ratio control with appropriate figure. (8)

PART C

Answer any two full questions, each carries 20 marks.

7 a) Describe process interaction in 2x2 system with two single loop controllers. (10)

b) Define fuzzy set operations. Enumerate the properties of fuzzy set. (10)

8 a) Discuss dynamic matrix controller. (10)

b) Explain multiloop control performance enhancement through loop pairing. (10)

9 a) Discuss the effect of interaction on stability of multiloop system. (10)

b) Explain model predictive control. (10)

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