QPC: RJ20MTECH003 AR 19 Reg. No

GIET UNIVERSITY, GUNUPUR – 765022

M. Tech (First Semester – Regular) Examinations, June – 2021

MPCCH1010 – Advanced Process Control

(Chemical Engineering)

Time: 2 hrs Maximum: 50 Marks

The figures in the right hand margin indicate marks.

PART – A **(2 x 10 = 20 Marks)**

Q1. Answer **ALL** questions

a. Define override control

b. Give the advantages of cascade control over conventional control.

c. When split-range control system is used?.

d. How does model predictive control work?

e. Define Internal Model Control.

f. Assess the sensitivity of multivariable process.

g. What is decoupling control?

h. Define a discrete system and indicate how it is different from a continuous system.

i. Draw the block diagram for a process with hold element and its corresponding pulse transfer function.

j. Find the Z-transform of e^{-at}.

PART – B **(6 x 5 = 30 Marks)**

Answer ***ANY FIVE*** questions **Marks**

2. Demonstrate the concept of feed forward control with the aid of block diagram. 6

3. Draw the block diagram and examine the importance of cascade control using an example. 6

4. Explain the Internal Model Control procedure for single input single output system. 6

5. Design an Internal Model Control for a process which is first-order with transport lag. 6

$$\bar{g}_p(s) = k_p \frac{e^{-\theta s}}{\tau_p s + 1}$$

6. Explain in detail about properties and application of Relative Gain Array for determining the best input-output pairings for multivariable process control systems. 6

7. Explain how synthetic input affects only one process output using decoupling control strategy by assuming a perfect model. 6

8. List and explain the properties of Z transform with proof for initial and final value theorems. 6

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