Sem-VI Process Instrumentation System 23/5/09
717 : H-m.
IMST
VR-5340

Con. 3078-09. (REVISED COURSE)

(3 Hours) [Total Marks : 100

N.B. (1) Question No. 1 is **compulsory**.
(2) Answer any **four** out of remaining **six** questions.
(3) Assume any **suitable data** wherever **required** but **justify** the same.
(4) Illustrate the **answers** with **sketches** wherever **required**.
(5) **All** questions carry **equal** marks.

1. Attempt any **four** questions :—
   (a) What are the modeling methods and their difficulties ?
   (b) Differentiate between the batch and continuous processes.
   (c) Explain the terms w. r. t. batch process – Recipe / Grade / Unit / Operation / Procedure.
   (d) Explain the inverse response or non minimum phase response and dead time in dynamic systems.
   (e) Explain the various modes of ON-OFF controller with suitable examples.
   (f) Discuss the responses of First order systems with one example.

2. (a) Develop a mathematical model for mixing process.
   (b) How degrees of freedom and process controllers are interlinked ? Discuss the degrees of freedom in a STH.

3. (a) Explain the various parameters which dominates the performance of the second order system with one example.
   (b) Explain the terms interacting and non interacting processes. Justify – *interacting capacities are more sluggish than the non-interacting.*

4. (a) Comment on the selection of control schemes for continuous and batch processes with justification.
   (b) Suggest the control schemes for jacketed Batch reactor to control the temperature in the reactor. The steam is used for heating the material in the reactor.

5. (a) Explain split-range and cascade control schemes with examples.
   (b) Develop electronic PID controller. Explain the role of each term in process control.

6. (a) Discuss the architecture of PLC.
   (b) Draw a ladder for fully automatic washing machine.

7. (a) Assume suitable data and explain how the controller is tuned,using Ziegler-Nichols method.
   (b) Justify the need of adaptive controller. What is the basic principle behind the adaptive controller ?