Sem VI / Inst. / 04-12-10 / Process Inst. System

123 2nd half-Exam 10-Mina (a)

Con. 6025-10. **(REVISED COURSE)** **GT-7578**

(3 Hours) **[Total Marks : 100**

N.B. (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** questions out of remaining **six** questions.
(3) Illustrate your answer with **sketches**.
(4) Assume **suitable** data if **required**.

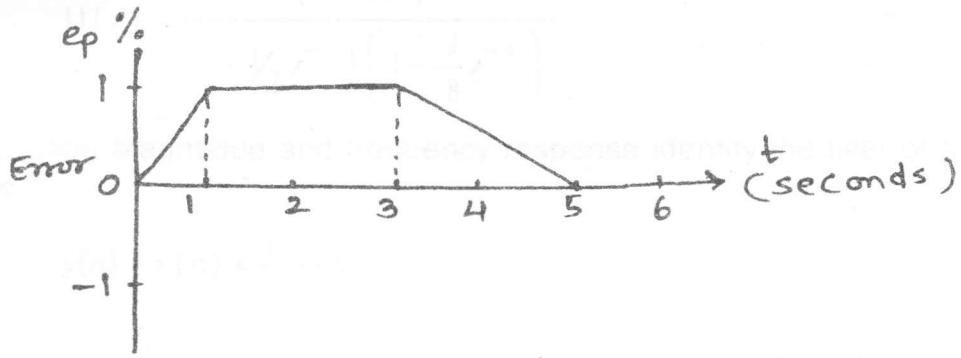
1. Attempt any **five** questions :—
   (a) Explain in brief Dynamic behaviour of First Order system. **4**
   (b) What do you mean by Reset Action ? Explain. **4**
   (c) Plot response curve for step load change using PID controller. **4**
   (d) Why selective control is necessary ? **4**
   (e) State general features of Electronic Controller. **4**
   (f) Explain why Discrete state process control is required ? **4**

2. (a) Explain in detail PID control actions for Typical Heating System ? **10**
   (b) Explain with a neat sketch Split Range Control Schem. **10**

3. (a) Explain construction and working of Pneumatic PI Controller using Bellows. **10**
   (b) Compare in detail Batch versus continuous process control. **10**

4. (a) Why Controller Tunning is required ? Explain Process Reaction Curve Tunning Method. **10**
   (b) Explain with example Interacting and Non-interacting Systems. **10**

5. (a) For given error applied to proportional-derivative controller with $K_P = 5$, $K_D = 0{\cdot}5$ s and $P_O = 20\%$. **10**



   Draw a graph of resulting controller output.
   (b) Explain in detail cascade control scheme for CSTR. **10**

6. (a) Explain relative gain analysis in detail. **10**
   (b) With suitable example, explain physical ladder diagram elements in detail. Assume suitable data if required. **10**

7. Write short notes on :— **20**
   (a) Adaptive Control
   (b) Multivariable Systems
   (c) Process Characteristics
   (d) Dead Time Processes.