EI-702

B. E. (Seventh Semester)

EXAMINATION, May/June, 2006

(Electronics & Instrumentation Engg. Branch)

PROCESS CONTROL

(EI – 702)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : Attempt any *five* questions. All questions carry equal marks.

(a) Draw the symbols for the following final control elements :   10
   (i) Orifice Plate
   (ii) Control Valve
   (iii) Motor Actuator
   (iv) Pneumatic Actuator

(b) Describe two commonly used standards for representing the range of variable in control systems.   10

2. What is cascade control system ? When are such system used in process control applications ? Illustrate with neat   R. T. O.

version, ω_s is sampling frequency.

3. (a) Explain the construction and working of a pneumatic control valve.   10
   (b) Explain the operating principle of stepper motors. 10

4. Explain the following basic control modes :   20
   (a) Proportional control
   (b) Integral control
   (c) Derivative control
   (d) PID control

5. (a) Describe the steps involved in degrees of freedom analysis for a process.
   (b) Describe the different tuning schemes for a PID controller.

6. (a) What are the factors that should be known for selecting a control valve ? What are its advantages over the conventional digital control system ?
   (b) Describe the following process characteristics :
      (i) Process equation
      (ii) Process load
      (iii) Process lay
      (iv) Self-regulation

7. Write short notes on the following :
   (a) PLC
   (b) Direct Digital Control
   (c) Z-Transform
   (d) P and I Diagram