R09

Code No: C8803

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.Tech I - Semester Examinations, March/April -2011
PROCESS CONTROL INSTRUMENTATION
(ELECTRONICS & INSTRUMENTATION)

Time: 3hours **Max. Marks: 60**

Answer any five questions
All questions carry equal marks
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1. a) What is degree of freedom? Explain with an appropriate example.
   b) Give an example for interacting first order elements in series. Write differential equations for this combination and determine transfer function. [12]

2. a) Draw a three mode electronic controller and derive the expression for the out put voltage.
   b) What is meant by process tuning and the list various methods of tuning of PID parameters? Explain briefly reaction curve method of tuning. [12]

3. Determine the properties of the inner loop in a cascade control system and explain the principle advantages of cascade control system. [12]

4. a) What is a control valve? Discuss about the operation of butterfly valve. Where is this valve used?
   b) What is the significance of control valve sizing? Discuss about various steps involved in selecting control valve size. [12]

5. a) Explain the process of controlling reflux in distillation column.
   b) Explain the control of indirect bottom product in a distillation column. [12]

6. a) Briefly explain the use of PLCs in instrumentation.
   b) Explain the functional blocks of PLC programming. [12]

7. With an example and necessary diagrams explain the operation of DCS in instrumentation control. [12]

8. Write short notes on
   (a) Design aspects of instrumentation for power
   (b) Automobile automation – design of control loops. [12]

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