

**III B.Tech I Semester Supplementary Examinations, May 2005**

**PROCESS CONTROL**  
**(Electronics & Control Engineering)**

**Time: 3 hours**

**Max Marks: 80**

**Answer any FIVE Questions**  
**All Questions carry equal marks**

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1. (a) Obtain the expression for the resistance and capacitance for thermal system.  
(b) Write the characteristics of liquid level system.
2. (a) Briefly explain the control modes.  
(b) An integral controller is used for speed control with a set point of 15 rpm, range of 10 to 20 rpm. The integral constant  $K_I = -0.2\%$  controller output per second per percentage error. The controller output is 28% initially. If the speed jumps to 17 rpm, calculate the controller output after 3sec for a constant error.
3. (a) Compare Pneumatic transmission with hydraulic transmission.  
(b) Explain the Gear – Box mechanism.
4. (a) Discuss about working of pneumatic P + I controller with neat diagrams.  
(b) Discuss about hydraulic integral controller with neat sketch.
5. Write a short notes on
  - (a) Globe valves
  - (b) Ball valves
  - (c) Butterfly valves
6. (a) Discuss about the super heat steam temperature control.  
(b) Explain about the direct mixing heat exchange between two fluids with necessary mathematical explanation.
7. Draw a neat figure of distillation column with its major control loops and explain.
8. With suitable diagrams explain the operations involved in nuclear power plant.

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