Code.No: **RR311004** | RR | SET-1

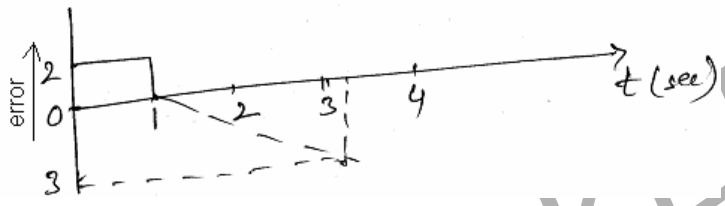
III B.TECH – I SEM EXAMINATIONS, NOVEMBER - 2010
PROCESS CONTROL INSTRUMENTATION
(COMMON TO EIE, ICE)

Time: 3hours **Max.Marks:80**

Answer any FIVE questions
All questions carry equal marks
- - -

1. Name five flow laws relating to fluids, heat and electricity and state these laws. [16]

2.a) A proportional controller has a gain of 3. Plot the controller output for the error given below fig1. If $P_0 = 50\%$. [P_0- controller output with no error]



b) With neat sketches, explain the principle of integral control action [10+6]

3.a) Describe the output of a three mode controller for an assumed error variation. Discuss its features.
b) With an analytic expression of a PID control explain the effect of each mode on the output of the composite controller. [8+8]

4.a) Write a short note on following errors
i) IAE ii) ITAE iii) ISE
b) Explain the importance of $1/4^{th}$ decay ratio. [8+8]

5. Illustrate with relevant graphs. The following methods of optimum settings from the plant response
a) Damped Oscillation method
b) Reaction-curve method. [16]

6. Explain the principle of a direct and reverse pneumatic actuator [16]

7.a) Explain the flapper nozzle system with the help of its characteristic curves
b) Explain the following:
i) Quicle operating
ii) Linear
iii) Equal percentage characteristics of a control valve [8+8]

8. Write the steps followed in choosing a valve for better control of flow and should be cost effective. [16]

--ooOoo--

Code.No: **RR311004** | RR | SET-2

III B.TECH – I SEM EXAMINATIONS, NOVEMBER - 2010
PROCESS CONTROL INSTRUMENTATION
(COMMON TO EIE, ICE)

Time: 3hours **Max.Marks:80**

Answer any FIVE questions
All questions carry equal marks
- - -

1.a) Describe the output of a three mode controller for an assumed error variation. Discuss its features.
b) With an analytic expression of a PID control explain the effect of each mode on the output of the composite controller. [8+8]

2.a) Write a short note on following errors
i) IAE ii) ITAE iii) ISE
b) Explain the importance of $1/4^{th}$ decay ratio. [8+8]

3. Illustrate with relevant graphs. The following methods of optimum settings from the plant response
a) Damped Oscillation method
b) Reaction-curve method. [16]

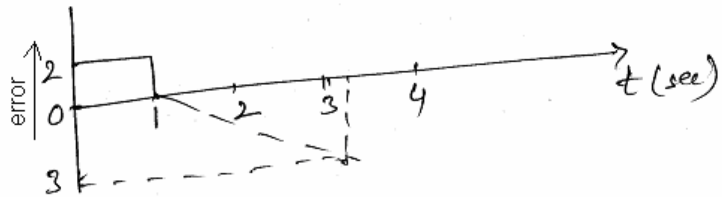
4. Explain the principle of a direct and reverse pneumatic actuator [16]

5.a) Explain the flapper nozzle system with the help of its characteristic curves
b) Explain the following:
i) Quicle operating
ii) Linear
iii) Equal percentage characteristics of a control valve [8+8]

6. Write the steps followed in choosing a valve for better control of flow and should be cost effective. [16]

7. Name five flow laws relating to fluids, heat and electricity and state these laws. [16]

8.a) A proportional controller has a gain of 3. Plot the controller output for the error given below fig1. If $P_0 = 50\%$. [P_0- controller output with no error]



b) With neat sketches, explain the principle of integral control action [10+6]

--ooOoo--

Code.No: **RR311004** | RR | SET-3

III B.TECH – I SEM EXAMINATIONS, NOVEMBER - 2010
PROCESS CONTROL INSTRUMENTATION
(COMMON TO EIE, ICE)

Time: 3hours **Max.Marks:80**

Answer any FIVE questions
All questions carry equal marks
- - -

1. Illustrate with relevant graphs. The following methods of optimum settings from the plant response
   a) Damped Oscillation method
   b) Reaction-curve method. [16]

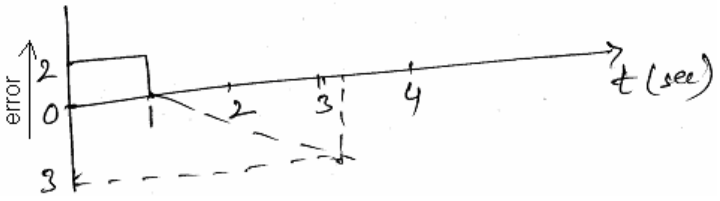
2. Explain the principle of a direct and reverse pneumatic actuator [16]

3.a) Explain the flapper nozzle system with the help of its characteristic curves
   b) Explain the following:
      i) Quicle operating
      ii) Linear
      iii) Equal percentage characteristics of a control valve [8+8]

4. Write the steps followed in choosing a valve for better control of flow and should be cost effective. [16]

5. Name five flow laws relating to fluids, heat and electricity and state these laws. [16]

6.a) A proportional controller has a gain of 3. Plot the controller output for the error given below fig1. If $P_0 = 50\%$. [P_0- controller output with no error]



   b) With neat sketches, explain the principle of integral control action [10+6]

7.a) Describe the output of a three mode controller for an assumed error variation. Discuss its features.
   b) With an analytic expression of a PID control explain the effect of each mode on the output of the composite controller. [8+8]

8.a) Write a short note on following errors
      i) IAE ii) ITAE iii) ISE
   b) Explain the importance of $1/4^{th}$ decay ratio. [8+8]

--ooOoo--

Code.No: **RR311004** | RR | SET-4

III B.TECH – I SEM EXAMINATIONS, NOVEMBER - 2010
PROCESS CONTROL INSTRUMENTATION
(COMMON TO EIE, ICE)

Time: 3hours **Max.Marks:80**

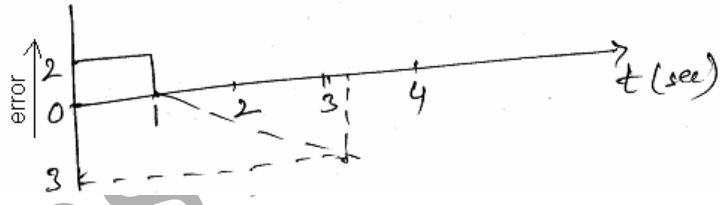
Answer any FIVE questions
All questions carry equal marks
- - -

1.a) Explain the flapper nozzle system with the help of its characteristic curves
b) Explain the following:
i) Quicle operating
ii) Linear
iii) Equal percentage characteristics of a control valve [8+8]

2. Write the steps followed in choosing a valve for better control of flow and should be cost effective. [16]

3. Name five flow laws relating to fluids, heat and electricity and state these laws. [16]

4.a) A proportional controller has a gain of 3. Plot the controller output for the error given below fig1. If $P_0 = 50\%$. [P_0- controller output with no error]



b) With neat sketches, explain the principle of integral control action [10+6]

5.a) Describe the output of a three mode controller for an assumed error variation. Discuss its features.
b) With an analytic expression of a PID control explain the effect of each mode on the output of the composite controller. [8+8]

6.a) Write a short note on following errors
i) IAE ii) ITAE iii) ISE
b) Explain the importance of $1/4^{th}$ decay ratio. [8+8]

7. Illustrate with relevant graphs. The following methods of optimum settings from the plant response
a) Damped Oscillation method
b) Reaction-curve method. [16]

8. Explain the principle of a direct and reverse pneumatic actuator [16]

--ooOoo--