Code No: RR412202 **Set No. 1**

IV B.Tech I Semester Regular Examinations, November 2005
CHEMICAL AND PHARMACEUTICAL INDUSTRIAL INSTRUMENTATION
(Instrumentation & Control Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Write the manufacture of synthetic petrol by Berger's process with a neat sketch. [16]

2. (a) Write the properties of heat radiation.
   (b) Explain the concept of black body. [8+8]

3. (a) What things should be considered when installing a flow control?
   (b) What are the possible causes of failure of a flow control valve? [8+8]

4. Derive the transfer function θ/θ s and θ/x for the following example under normal operating conditions as shown in figure 1 [16]

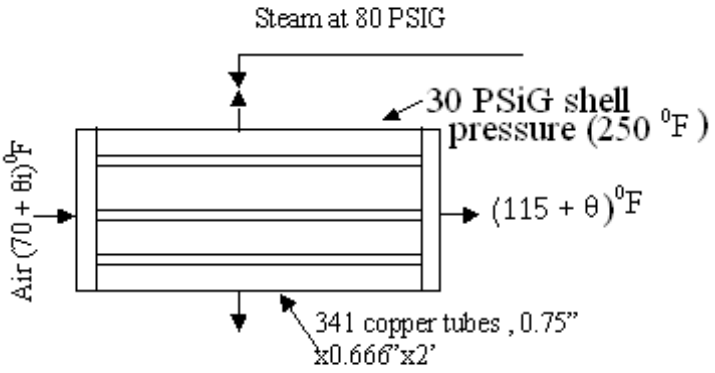

Figure 1:

5. Write a note on the following:
   (a) Control overhead composition
   (b) Control of bottom composition [8+8]

6. (a) Write the effect of Feed rate and total hold up.
   (b) Write a note on lag in vapor flow with a neat diagram. [8+8]

7. What are the applications of control of chemical reactors? Explain stirred - tank reactors in detail. [16]

8. What is blending process? Explain mixing time studies in detail. [16]

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Code No: RR412202 **Set No. 2**

IV B.Tech I Semester Regular Examinations, November 2005
CHEMICAL AND PHARMACEUTICAL INDUSTRIAL INSTRUMENTATION
(Instrumentation & Control Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. What is an orifice meter? How is it used for measuring the rate of flow of a fluid through a pipe line? Derive the relevant equation from Bernoulli's theorem. [16]
2. What are the heat exchangers? Explain logarithmic mean temperature difference in heat exchange process. [16]
3. Explain different types of flow control valves with neat diagrams. [16]
4. Explain the throttle steam flow method of control schemes of heat exchangers. [16]
5. What is survey of control schemes? Explain it with neat sketches. [16]
6. (a) Write the effect if equilibrium line slope on concentration lags.
   (b) Write a note on lag in liquid flow with a neat diagram. [8+8]
7. Explain the peak temperatures in tubular reactor with graphical representations. [16]
8. (a) Explain gain margin and phase margin.
   (b) Determine the value of k so that gain margin 6db and determine the value of K so that phase margin is 40^0 for the open loop transfer function of a system is G(S) = K/S(1+0.1S)(1+S). [8+8]

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Code No: RR412202 **Set No. 3**

IV B.Tech I Semester Regular Examinations, November 2005
CHEMICAL AND PHARMACEUTICAL INDUSTRIAL INSTRUMENTATION
(Instrumentation & Control Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. What are the methods of polymerization? Discuss them in detail with suitable example. [16]
2. (a) Write location of the sensing element by using temperature bulbs.
   (b) Discuss the analytical instruments used to control distillation columns. [8+8]
3. Explain different types of flow control valves with neat diagrams. [16]
4. What are the different measuring elements used in temperature control systems and explain in detail? [16]
5. What are the different analytical instruments used in the control of compositions? Discuss in detail. [16]
6. Write a note on the following:
   (a) Effect if feed rate and total hold
   (b) Re-boiler holder [8+8]
7. Explain the peak temperatures in tubular reactor with graphical representations. [16]
8. Explain Ziegler - Nichols Tuning technique with and example. [16]

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Code No: RR412202 **Set No. 4**

IV B.Tech I Semester Regular Examinations, November 2005
CHEMICAL AND PHARMACEUTICAL INDUSTRIAL INSTRUMENTATION
(Instrumentation & Control Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Giving a neat labeled sketch of a centrifugal pump, explain its design and operation.
   (b) What are the applications of centrifugal pumps in pharmacy? What are their advantages and limitations? [8+8]
2. Write the application lf dimensional analysis to heat convection. [16]
3. (a) Write the role of evaporators in the Sugar industry.
   (b) What are the different components that are considered in pressure control? [8+8]
4. Sketch the neat diagram of temperature transmitter with derivative action and explain in detail. [16]
5. What is survey of control schemes? Explain it with neat sketches. [16]
6. Explain frequency response of columns with one example. [16]
7. Explain the peak temperatures in tubular reactor with graphical representations. [16]
8. What is blending process? Explain mixing time studies in detail. [16]

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