B.E (Instru) Sem-VIII CBGS   11/12/18

(1/2)

(3 Hours)   Total Marks: 80

Note:
1. Question No.1 is compulsory
2. Solve any THREE questions out of remaining FIVE questions.
3. Figure to the right indicate full marks.
4. Assume suitable data if required.

Q1. Solve any 4   [20marks]
   a) Explain Aerodynamic and Hydrodynamic valve noise.
   b) Define control valve coefficient. Give the factors that affect this coefficient.
   c) Discuss the following terms related to reliability: MTTR and MTBF
   d) What is ergonomics? Give example of ergonomics applied to a product.
   e) What are the design considerations of an RTD?

Q2.

   a) Explain phases of Electronic product design.   [10marks]

   b) A 3" Butterfly valve is to operate at the following conditions-   [10marks]

      Fluid- Water at flow rate 330gpm

      P_v = 0.4 psia, P_1= 24psia, P_2= 15psia   d=3.068"

      State whether the valve will cavitate or not, and if it cavitates, to what extent?

Q3.

   a) Water at 15° C is flowing through 12 inch standard weight pipe (D= 12) at a rate   [10marks]
      that will not exceed 2800gpm. It is proposed that a standard 60° opening
      Butterfly valve be used for control. Find size required, if p_1 is computed to be
      72.2psia and p_2 is 64.1psia.

   b) What is absolute calibration? Explain Thermocouple calibration using absolute method   [10marks]

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B.E (Instru) SEM-VIII CBGS   11/12/18

2/2

Q4.

a) Explain choked flow condition and expansion factor for gases.   [10marks]
b) Find valve size for the following conditions   [10marks]

Fluid - Benzene with fine non abrasive solids

G = 0.88

q = 450 gpm

p_1 = 80 psia

p_2 = 71 psia

T_1 = 528° R

D = 6 inch schedule 40

Valve is characterized ball with C_d=25.

Q5. Write short note on

a) Control room design layout   [10marks]
b) Protection standards for electrical enclosures.   [10marks]

Q6.

a) Explain the general selection criteria for transducers.   [10marks]
b) Explain with diagram methods of control valve noise reduction. [10marks]

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