C.U.SHAH UNIVERSITY
Summer Examination-2017

Subject Name : Instrumentation Systems

Subject Code : 4TE06INS1   **Branch: B.Tech (IC)**

Semester : 6   Date : 11/04/2017   Time : 02:30 To 05:30   Marks : 70

Instructions:
   (1) Use of Programmable calculator & any other electronic instrument is prohibited.
   (2) Instructions written on main answer book are strictly to be obeyed.
   (3) Draw neat diagrams and figures (if necessary) at right places.
   (4) Assume suitable data if needed.

Q-1   Attempt the following questions:

(14)

a) Transfer function of a system is used to calculate which of the following?
  a) The order of the system   b) The time constant   01
  c) The output for any given input   d) The steady state gain

b) Which of the following control loop is a zero-order system.
  a) Pressure control loop   b) Temperature control loop   01
  c) Flow control loop   d) Level control loop

c) What does H represents in TAH as per ANSI Lettering Nomenclature
  a) Hydrogen   b) Helium   c) Humidity   d) High   01

d) What does T represents in LRT as per ANSI Lettering Nomenclature.
  a) Temperature   b) Transmitter   c) Transformer   d) None of the above   01

e) Which of the following method is/are used for mounting instrument with a pipe.
  a) Pedestal mounting   b) Line mounting   01
  c) Either a or b   d) None of the above

f) Intrinsically safe device can be designed by using which of the following components
  a) Using resistor and Zener diode   b) Using resistor and transformer   01
   c) Either a or b   d) None of the above

g) Which sheet depicts information regarding list of all the components used in any
      instrument or machine.   01
  a) P & I Diagram.   b) Instrument Index sheet
  c) Instrument data sheet   d) Bill of material

h) Full form of NPT is _____.
  a) Normal pipe tape   b) Normal pipe tapping   01
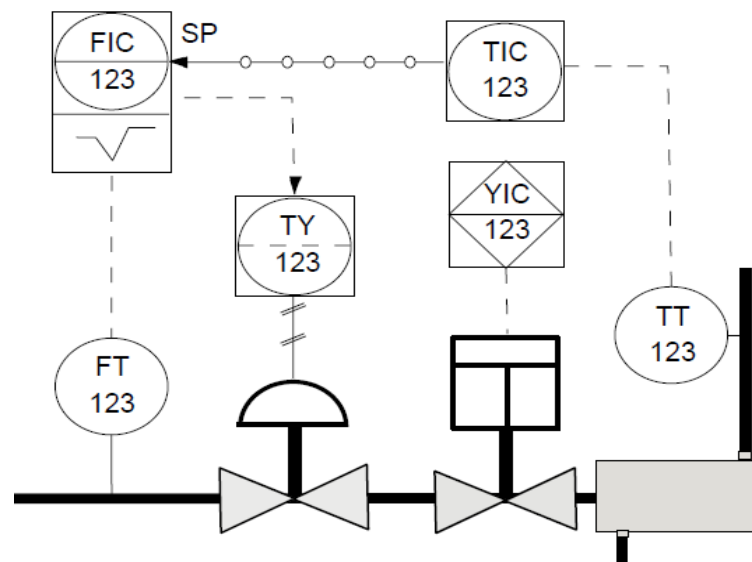 c) Nominal pipe tapered   d) Nominal pipe thread

i) Which type of drift can be found in an instrument.
a) Zero drift   b) Span drift   01
c) Hysteresis drift   d) Any of the above

j) Response of a system to a constant input is called _____ response.
a) Frequency   b) Impulse   c) Step   d) None of these   01

k) Response of a system to a sinusoidal input is called _____ response.
a) Frequency   b) Impulse   c) Step   d) None of these   01

l) What does the third letter on an ISA symbol indicate?
a) Device function or modifier   b) Measured variable   01
c) Readout   d) Modifier

m) What does the second letter on an ISA symbol indicate?
a) Device function   b) Modifier   01
c) Readout   d) Any of the above

n) What does the first letter on an ISA symbol indicate?
a) Device function   b) Measured variable   01
c) Readout   d) Modifier

Attempt any four questions from Q-2 to Q-8

Q-2   **Attempt all questions**   (14)
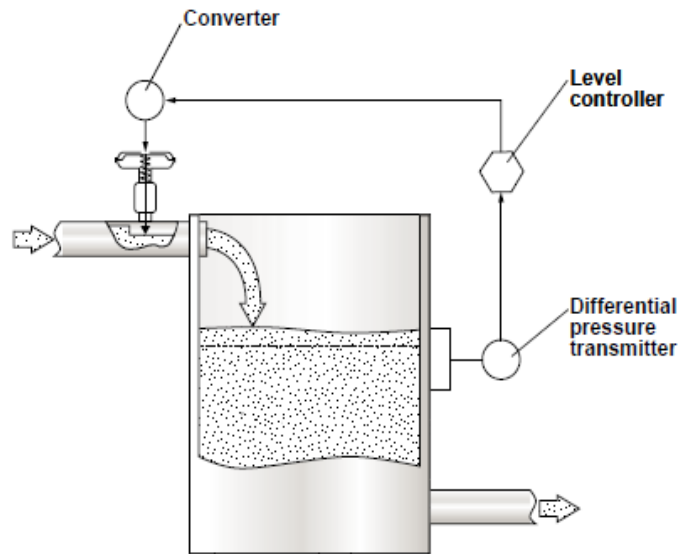
a) What do you mean by plant start up? Explain the plant start up procedure.   05

b) Interpret the following Process & Instrumentation Diagram.   05

c) Explain the role of an Instrument engineer in any process industry.   04

Q-3   **Attempt all questions**   **(14)**

     a)   What does the following ISA identification letters indicate: 05
        i) FIC
        ii) AIC
        iii) FQ
        iv) TW
        v) TRC

     b)   Draw the Process & Instrumentation Diagram of the following process flow diagram.   05

     c)   Give differences between process flow sheet and P & I diagram   04

Q-4   **Attempt all questions**   **(14)**

     a)   Write a short note on Intrinsic type of safety in process industry.   05

     b)   Define the following terminology: 05
        i)   Interlock diagram
        ii)   Elevation drawing
        iii) Baloon symbol
        iv) Installation specifications.
        v)   Instrument specification sheet

     c)   Explain the check-out procedure for control valve   04

Q-5   **Attempt all questions**   **(14)**

     a)   Explain Instrumentation air system with suitable diagram.   05

     b)   Explain purging and classify its type.   05

     c)   Write short note on Calibration.   04

Q-6   **Attempt all questions**   **(14)**
  a)   Discuss check list of good installation procedures.   07

  b)   Explain layout of a typical control room with suitable diagram.   07

Q-7   **Attempt all questions**   **(14)**
  a)   Draw and explain Pneumatic control loop wiring diagram.   07

  b)   Discuss different types of control panel in brief.   07

Q-8   **Attempt all questions**   **(14)**
  a)   Draw and explain Electronic loop wiring diagram   07

  b)   Classify hazardous area and material according to NEC (National Electric Code).   07