

C.U.SHAH UNIVERSITY

Summer Examination-2016

Subject Name : Instrumentation Systems

Subject Code : 4TE06INS1

Branch: B.Tech (IC)

Semester : 6

Date : 06/05/2016

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.
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- Q-1 Attempt the following questions: (14)**
- a) Which of the following methods is/are used for mounting instrument with a pipe? 01
- a) Pedestal mounting
 - b) Line mounting
 - c) Either a or b
 - d) None of the above
- b) Purging which covers requirement adequate to reduce classification within an enclosure from Division II to Non-hazardous 01
- a) Type Z b) Type Y c) Type X d) Non hazardous
- c) Which sheet gives information about the process material composition and its external conditions? 01
- a) Instrument Specification sheet b) Process And Instrumentation diagram
 - b) Instrument data sheet d) Process flow Sheet
- d) Which variable is given as an input to the Controller? 01
- a) Manipulated variable b) controlled variable c) load variable d) Error
- e) Which sheet does depict information regarding piping and process connection 01
- a) Instrument Specification sheet b) Instrument Index sheet
 - b) Instrument data sheet d) Process And Instrumentation diagram
- f) Which sheet does depict information regarding height of the process equipment? 01
- a) Process flow Sheet b) Foundation Plan
 - b) Elevation drawing d) Process And Instrumentation diagram
- g) Which type of drift can be found in an instrument? 01
- a) Zero drift b) span drift c) hysteresis drift d) Any of the above
- h) How to represent position transmitter as per ANSI Lettering Nomenclature? 01
- a) PT b) XT c) YT d) ZT
- i) Which symbol does give location information of the instrument? 01
- a) Line symbol b) Balloon Symbol c) Tag Symbol d) None of the above



- j) Which sheet does depict information regarding instrument type and its function? 01
 - a) Instrument Specification sheet
 - b) Instrument Index sheet
 - c) Process Flow Sheet
 - d) Process And Instrumentation diagram
- k) During startup of the process plant which of the following tasks has to be performed? 01
 - a) Control loop Check
 - b) Instrument Testing
 - c) Tuning of Control loop
 - d) All of the above
- l) Intrinsically safe device can be designed by using which of the following components 01
 - a) Using resistor and Zener diode
 - b) Using resistor and transformer
 - c) Either a or b
 - d) None of the above
- m) Which of the following devices is used for pressure calibration? 01
 - a) Pressure gauge
 - b) Dead Weight Tester
 - c) Strain Gauge
 - d) Barometer
- n) Which of the following process connection/connections are widely used to connect instrument with the pipe? 01
 - a) NPT
 - b) BSPT
 - c) Either a or b
 - d) NPTH

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

- Q-2 **Attempt all questions** (14)
 - a) Discuss check list of good installation practices. 07
 - b) Draw ISA/ANSI symbols for the following: 07
 - 1) Capillary tube
 - 2) Butterfly valve
 - 3) Safety valve
 - 4) Magnetic Flow meter
 - 5) Ball Valve
 - 6) Venturi tube
 - 7) Data link line

- Q-3 **Attempt all questions** (14)
 - a) Classify hazardous area and material according to NEC (National Electric Code). 07
 - b) Give classification of control panels with suitable diagram. 07

- Q-4 **Attempt all questions** (14)
 - a) Draw and explain Pneumatic loop wiring diagram. 07
 - b) Explain in detail intrinsic safety with suitable example and state its advantage and disadvantage. 07

- Q-5 **Attempt all questions** (14)
 - a) Draw and explain Electronic loop wiring diagram 07
 - b) Explain layout of a control room with suitable diagram. 07

- Q-6 **Attempt all questions** (14)
 - a) Discuss electronic versus pneumatic instruments and the design based on it. 07
 - b) List different criteria for Instrument Air System. Draw and explain large air instrumentation system. 07



- Q-7** **Attempt all questions** **(14)**
- a) Explain the installation details of a d/p cell. 07
 - b) Draw and explain instrument specification sheets 07
- Q-8** **Attempt all questions** **(14)**
- a) Explain purging and mention its type. 05
 - b) Justify the importance of P & I diagram and Instrument specification sheets. 05
 - c) Explain the roles of Instrumentation engineer in any process industry. 04

