## Scheme - I

## Sample Question Paper

**Program Name** : **Diploma in Instrumentation / Instrumentation & Control**

**Program Code** : **IS / IC**

**22542**

**Semester** : **Fifth**

**Course Title** : **Process Instrumentation**

**Marks** : **70** **Time: 3 Hrs.**

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**Instructions:**

(1) All questions are compulsory.

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(4) Assume suitable data if necessary.

(5) Preferably, write the answers in sequential order.

**Q.1) Attempt any FIVE of the following.** **10 Marks**

a. Define i) Dead time ii) Inertia

b. State the Standard signal of Electronic and Pneumatic transmission system.

c. Draw the block diagram of single channel DAS.

d. State the need of control panels.

e. Classify the following materials into appropriate hazardous area : 1) LPG 2) Acetylene

f. State any four benefits of Process Instrumentation.

g. Explain the meaning of Hazardous area.

**Q.2) Attempt any THREE of the following.** **12 Marks**

a) Draw a labeled block diagram of process control system. Define i) manipulated variable ii) controlled variable

b) Describe the operation of flapper-nozzle mechanism with neat sketch.

c) Explain Self Balancing type Strip Chart recorder with neat schematic.

d) Explain pressure to current converter with neat schematic.

**Q.3) Attempt any THREE of the following. 12 Marks**

a. Explain Live Zero Concept.

b. Name the documents needed to design the control panel. Describe any one.

c. Describe any four Ergonomic considerations of Control room environment.

d. Give the meaning of IP 65 and IP 56.

**Q.4) Attempt any THREE of the following. 12 Marks**

a. List different Process Characteristics. Explain any one with neat diagram.

b. Describe the calibration procedure of DP transmitter.

c. Describe with neat diagram the working of temperature transmitter.

d. Draw the schematic of i) Flat Control panels ii) Breakfront Control panels.

e. Describe with diagram the Intrinsic safety technique using passive zener barrier circuit

**Q.5) Attempt any TWO of the following. 12 Marks**

a. Draw the diagram of force balance pressure transmitter. Explain its working

b. State the need of recorders. Explain the working of X-Y recorder with neat sketch.

c. Classify Hazardous area according to the materials.

**Q.6) Attempt any TWO of the following. 12 Marks**

a. Draw block diagram of SMART transmitter. Explain each block in brief.

b. Describe with diagram the working of data logger. Compare data logger with DAS.

**c.** Draw the schematic diagram of a typical alarm annunciator. Describe its operational sequence.

## Scheme - I

## Sample Test Paper - I

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**Semester** : **Fifth**

**22542**

**Course Title** : **Process Instrumentation**

**Marks** : **20** **Time: 1 Hour.**

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**Instructions:**

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(4) Assume suitable data if necessary.

(5) Preferably, write the answers in sequential order.

**Q.1 Attempt any FOUR.** **08 Marks**

a. Compare pneumatic and electronic transmission methods.

b. State the benefits of process instrumentation.

c. List the standard ranges of pneumatic and electronic signal transmission

d. State the need of signal transmission system.

e. Draw the block diagram of multi-channel DAS.

f. Define calibration. State the need of it in process instrumentation.

**Q.2 Attempt any THREE.** **12 Marks**

a. State the salient features of SMART transmitter

b. Describe the calibration procedure of temperature transmitter.

c. Describe with diagram the working of DP transmitter.

d. Draw the block diagram of Data logger. Explain each block in brief.

e. Define i)Process equation ii)Process Load iii)Transient iv)Process Lag

## Scheme - I

## Sample Test Paper - II

**Program Name** : **Diploma in Instrumentation / Instrumentation & Control**

**Program Code** : **IS / IC**

**Semester** : **Fifth**

**22542**

**Course Title** : **Process Instrumentation**

**Marks** : **20** **Time: 1 Hour.**

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**Instructions:**

(1) All questions are compulsory.

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(4) Assume suitable data if necessary.

(5) Preferably, write the answers in sequential order.

**Q.1 Attempt any FOUR.** **08 Marks**

a. Name the Protection methods used in hazardous industry

b. Draw the layout of Flat end type control panel.

c. State any two applications of XY recorder

d. State the function of alarm annunciator

e. State the need of control panel

f. List the Documents needed to design the control panel

**Q.2 Attempt any THREE.** **12 Marks**

a. Describe any four Ergonomic considerations for designing the control room.

b. Describe with any example NEMA classification of enclosures.

c. Describe the Explosion proof method of protection for hazardous location.

d. Describe the working of strip chart recorder with neat sketch.

e. Draw current to pressure converter. Explain its working.