Scheme - I

Sample Question Paper

Program Name : Diploma in Chemical Engineering
Program Code : CH
Semester : Fourth
Course Title : Chemical Process Instrumentation and Control
Marks : 70 **Time: 3 Hrs.**

22407

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) Accuracy ii) Precision

b) Define the rangability of control valve.

c) List any four basic control actions.

d) State the principle of electromagnetic flowmeter.

e) Define the closed loop control system.

f) What is set point?

g) List any two dynamic characteristics and define any one of them.

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

a) Explain the construction and working of mercury in glass thermometer

b) Draw the neat sketch of C-type Bourdon tube.

c) List the different level measuring instruments. Draw any one of them.

d) List the different pneumatic elements used in control system. Draw the figure of flapper nozzle amplifier.

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

a) State the working principle of radiation pyrometer with neat sketch.

b) Explain the construction and working of dead weight tester with neat diagram.

c) State the principle of positive displacement flow meter with neat sketch.

d) Explain the linear and equal % valve characteristics with neat graphs.

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

a) A thermometer is calibrated from 0 to 200^0C. The accuracy is specified to be within ±0.25 % of span and ±0.75 % of upper range value. Calculate the actual reading of temperature for 100 ^{0}C measurement.

b) State the different electrical temperature transducer. Explain the working of any one of them.

c) State the principle of electrical pressure transducer. Draw a neat diagram of any one of them.

d) Explain the sight glass method of level measurement.

e) Draw the diagram of automatic control system.

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

a) Describe the construction and working of optical pyrometer with neat diagram.

b) Describe the construction and working of LVDT with neat diagram.

c) Describe the construction and working of Thermal mass Flow meter with neat diagram.

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

a) Describe the construction and working of air purge method of level measurement with neat diagram.

b) Describe the construction and working of pneumatic PI controller with neat sketch.

c) Describe the block diagram of distributed control system (DCS) with its architecture.

Scheme - I

Sample Test Paper - I

Program Name : **Diploma in Chemical Engineering**

Program Code : **CH**

22407

Semester : **Fourth**

Course Title : **Chemical Process Instrumentation and Control**

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

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) Define repeatability and reproducibility of instruments.

b) List the different temperature scales. Convert 99 ^{0}C into ^{0}K and ^{0}F.

c) Describe the working of bimetallic thermometer.

d) Draw the neat diagram of resistance temperature detector (RTD).

e) Describe the working of C-type bourdon tube.

f) Differentiate between +TCR and -TCR.

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

a) Explain the construction and working of McLeod gauge for vacuum measurement.

b) Describe the construction and working of thermistors.

c) State the significance of mercury in mercury in thermometer.

d) Describe the construction and working of Bellows type pressure gauge with neat diagram.

Scheme - I

Sample Test Paper - II

Program Name : **Diploma in Chemical Engineering**

Program Code : **CH**

22407

Semester : **Fourth**

Course Title : **Chemical Process Instrumentation and Control**

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

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) Define servo problem of control system.

b) Why D mode control action is not used alone?

c) What is ON-OFF control system? What is an offset?

d) Draw the neat diagram of Radioactive Level measurement.

e) Describe the working of pneumatic P mode control action with neat sketch.

f) Describe the working of Ultrasonic flowmeter with neat diagram.

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

a) Explain the block diagram of programmable logic control (PCL).

b) Describe the working of valve actuator in detail with neat diagram.

c) Describe the construction and working of Solonoid Valve with neat diagram.

d) Explain the linear and quick opening valve characteristics in details.

e) Describe the construction and working of capacitance type level measurement with neat diagram.