

Sample Test Paper - I

Course Name : Diploma in Instrumentation Engineering

Course Code : IS/IC

Semester : Sixth

Subject Title : Process Control System

Marks : 25

Time: 1 Hour

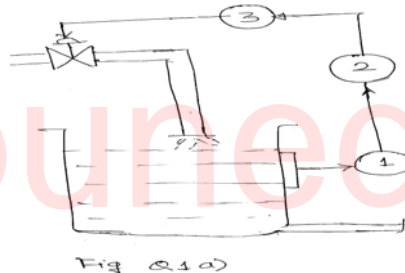
Instructions:

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 THREE

9 Marks

a) Identify the elements of level control system given below and state the functions of each.



- b) Draw different control valve flow characteristics. Give meaning of one of them.
- c) Compare feedback control and feedforward control.
- d) State the need of valve positioner.

Q.2 Attempt any TWO

8 Marks

- a) Discriminate human aided and automatic process control (any four points)
- b) State selection criteria for control valve (any eight points).
- c) Draw the neat diagram of ratio control system. Describe its working.

Q.3 Attempt any TWO

8 Marks

- a) Find the proper valve size in inches and centimetre for pumping the liquid flowrate of 600 gal/min with maximum pressure difference of 55 psi, liquid specific gravity is 1.3. Find valve size.
- b) Draw the neat sketch of butterfly valve. List its two application.
- c) Draw the block diagram of cascade control. Describe its working.

Sample Test Paper – II

Course Name : Diploma in Instrumentation Engineering

Course Code : IS/IC

Semester : Sixth

Subject Title : Process Control System

Marks : 25

17663

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 THREE

9 Marks

- a) List the interlocks used in boilers.
- b) Describe the concept of co-current and counter current in heat exchanger.
- c) Compare batch process & continuous process.
- d) State the need of Instrument Index Sheet.

Q.2 Attempt any TWO

8 Marks

- a) Draw P and ID symbol diagram for any one unit operation
- b) State the working of single effect evaporator with neat diagram.
- c) Draw the diagram of trend display used in DCS. State its significance with respect to any process parameter.

Q.3 Attempt any TWO

8 Marks

- a) Draw the architecture of DCS.
- b) Draw neat diagram of cascade control scheme used for distillation column process.
- c) State the functionality of Modbus and profibus in DCS.

Sample Question Paper

Course Name : Diploma in Instrumentation Engineering

Course Code : IS/IC

Semester : Sixth

Subject Title : Process Control System

Marks : 100

17663

Time: 3 Hours

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) A) Attempt any THREE of the following.

12 Marks

- a) Draw P & ID symbol for i) Temperature transmitter ii) Rotameter
iii) Orifice meter iv) Venturimeter
- b) Draw block diagram of adaptive control system and describe its working.
- c) State selection criteria for DCS system (Four points).
- d) Draw Feedforward control scheme for drum level of boiler and write its working in brief.

Q.1B) Attempt any ONE of the following.

06 Marks

- a) Draw physical diagram and P& I Diagram for single element and double element boiler process control.
- b) Enlist types of drying processes. Describe any one drying process with neat diagram.

Q.2) Attempt any TWO of the following.

16 Marks

- a) Define valve positioner. Draw the neat diagram of Electro pneumatic valve positioner. Write its working.
- b) Describe the working of distillation column with neat diagram. Draw cascade control scheme for any two variable in distillation column.
- c) Enlist different process displays. State the functions of any two displays. Draw the schematic diagram of DCS in cement industry. Write the steps to control process operation in cement industry.

Q.3) Attempt any FOUR of the following.

16 Marks

- a) Describe in brief feedback control scheme for heat exchanger with neat diagram.
- b) Draw control valve flow characteristics. Give meaning of any one.
- c) Compare feedback and feedforward control systems (Four points)
- d) Differentiate between single seated and double seated globe valve.
- e) Name the different DCS communication methods. Describe any one.

Q.4) A) Attempt any THREE of the following.

12 Marks

- a) Draw the block diagram of process control system. State function of any two blocks.
- b) Describe working of solenoid control valve with neat diagram.
- c) State the principle of evaporator. Draw feedforward control system for single effect evaporator.
- d) Write purpose of instrument index sheet and process flow sheet.

Q.4B) Attempt any ONE of the following.

06 Marks

- a) Describe different remedies to avoid problem of cavitation and flashing in control valve.
- b) Draw the architecture of MOD-BUS and state the function of each block.

Q.5) Attempt any TWO of the following.

16 Marks

- a) Describe the working of Split range control system with example. State the need of valve positioner.
- b) Enlist the documents required for instrumentation in project engineering. State role of instrumentation engineer in project engineering
- c) Draw the Architecture of DCS system. State functions of all components in it.

Q.6) Attempt any FOUR of the following.

16 Marks

- a) List the features of typical DCS (Eight points)
- b) Find the proper valve size in inches and centimetre for pumping the liquid flow rate of 600 gal/min with maximum pressure difference of 55 psi, liquid specific gravity is 1.3. Find valve size.
- c) Compare continuous and Batch process (Four points)
- d) Draw different interconnection P & ID symbols.
- e) Identify the elements of temperature control system given below and state the functions of each.

