17561

16172

3 Hours / 100 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

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

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Use of Non-programmable Electronic Pocket Calculator is permissible.

(7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. a) **Attempt any THREE of the following:** **12**

(i) Define static and dynamic characteristics of an instrument? State any four static characteristics of an instrument.

(ii) State the seeback and Peltier effect.

(iii) List direct liquid level measurement methods and draw a diagram for any one.

(iv) Draw the diagram of ultrasonic flow meter and explain its principle.

Marks

b) **Attempt any ONE of the following:** **6**

(i) Draw a neat labelled diagram of C type Bourdon tube and describe its working.

(ii) What is cascade control system? How are they used? Explain with a neat diagram.

2. Attempt any FOUR of the following: **16**

a) Give four differences between open and closed loop system.

b) To measure the pressure below atmosphere which device you would use? Draw the labelled diagram.

c) Differentiate between single seated and double seated valve.

d) What is man machine interface? Explain in brief.

e) Draw a neat labelled diagram showing the architecture of a programmable logic controller.

f) Explain with the labelled diagram the function of valve position.

3. Attempt any FOUR of the following: **16**

a) State the working principle of radiation pyrometer. Give its advantages and disadvantages.

b) State advantages and disadvantages of capacitance level indicator.

c) Describe how a pressure gauge is calibrated with the help of dead weight tester.

d) With the help of neat labelled diagram describe the working of an electromagnetic flow meter.

e) State the meaning of the terms servo operation and Regulator operations? Give one application of each.

Marks

4. a) **Attempt any <u>THREE</u> of the following:** **12**

(i) State the principle of a bimetalic thermometer. Describe its working with a neat diagram.

(ii) Convert 47°C temperature into Fahrenheit, kelvin Rankine.

(iii) State the principle of positive displacement flow meter. State two advantages of rotating vane meter.

(iv) Draw and explain working of thermal flow meter.

b) **Attempt any <u>ONE</u> of the following:** **6**

(i) What are the factors to be considered for selecting a control valve suitable for a process?

(ii) What are the basic functions of computer aided process control?

5. **Attempt any <u>FOUR</u> of the following:** **16**

a) Draw a neat labelled diagram of a rotameter and state its disadvantages.

b) Draw a neat labelled diagram for air purge method of liquid level measurement and describe its working.

c) State which method is used for level measurement for measuring level of liquid where no physical contact between liquid and instrument is allowed? Describe with neat labelled diagram.

d) How electrical pressure transducer is important in monitoring pressure.

e) State the following terms for bellows and diaphragm related to pressure measurement:

(i) Material

(ii) Pressure range

(iii) Application

(iv) Diagram

Marks

6. Attempt any TWO of the following: **16**

a) State any four advantages of automatic control and draw a block diagram of an automatic controller for closed loop of control showing all the basic elements.

b) State the important valve characteristics in detail.

c) With a neat sketches explain the construction and working of a distributed control system (DCS) used in process industries.