# 17561

**11920**

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

*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) 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) Give SI unit of pressure. Convert following pressure values to its SI unit.

(1) 14.7 Psi

(2) 700 mm of Hg

(3) 10 m of water

(ii) Explain construction and working of strain gauge.

(iii) Give any two advantages each of distributed control system and programmable logic controller (PLC)

(iv) Define the term Calibration and Drift of an instrument.

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

(i) Differentiate open loop and closed loop system. (any six points)

(ii) Give the temperature range of Hg thermometer and thermocouple. Convert following of values to °K.

(1) 100°F

(2) 65°F

P.T.O.

**Marks**

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

a) Explain the working of ultrasonic level detector.

b) Explain any two direct methods of liquid level measurement.

c) Explain the working of dead weight pressure gauge tester.

d) Draw a neat labelled diagram showing the architecture of PLC.

e) Explain control valve sizing.

f) Explain the working of bimetallic thermometer with neat labelled diagram.

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

a) Draw the neat sketch of radiation pyrometer. Explain its construction and working. Give any two application of it.

b) Explain Pneumatic PID controller with diagram. Give its any two applications.

c) Define control valve characteristics. Explain different types of control valve characteristics, with their graphs.

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

(i) Explain the working of bourdon tube pressure gauge with neat diagram.

(ii) Define:

(1) Accuracy

(2) Sensitivity

(3) Speed of response

(4) Precision

(iii) Explain the working of rotating vane flow meter.

(iv) Give any four features of distributed control system (DCS)

**Marks**

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

(i) Explain air to open and air to close type of control valve with their sketch of plug. Give the situations where these valves are used.

(ii) Explain the working of ultrasonic flow meter. Give its any four advantages.

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

a) Discuss ON-OFF control action. Define differential gap. State any two instances where it can prefer ON-OFF control and where it will avoid?

b) Explain construction and working DCS with neat sketch.

c) State the principle of positive displacement flow meters. Explain construction and working of rotating vane flow meter with neat diagram.

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

a) Explain the working of Mc Leod gauge with diagram.

b) Explain the construction and working of air purge method of liquid level measurement.

c) Explain the working of thermal flow meter.

d) Explain pressure gauge method for liquid level measurement.

e) Give the principle of magnetic flow meter. Explain its working.

f) Explain types of valves actuators with diagram.

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