

17561

16117

3 Hours / 100 Marks

Seat No.

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**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.

**Marks**

**1. (A) Attempt any THREE :**

**12**

(a) State any four types of thermocouple with material used & temperature range.

(b) Draw the diagram of capacitance level indicator & explain its working.

(c) State Seebeck & Peltier effect.

(d) Define four types of pressure.

**(B) Attempt any ONE :**

**06**

(a) Define static and dynamic characteristics of an instrument. List any four.

(b) Draw the diagram and explain working of optical pyrometer.

**2. Attempt any FOUR :****16**

- (a) Explain the working of Bimetallic thermometer with sketch.
- (b) Give the detailed classification of level measurements and give one eg. of each.
- (c) What is a valve positioner ? State two functions of valve positioner.
- (d) Draw the diagram of piston type variable area meter & explain working.
- (e) Draw and explain working of ultrasonic flow meter.

**3. Attempt any FOUR :****16**

- (a) Draw a neat labelled diagram for air purge method of level measurement and describe its working.
- (b) Draw the diagram and explain working of thermal flow meter.
- (c) Differentiate between open-loop and close-loop system. (four point)
- (d) Convert 1.5 bar into (a) Pascal (b) height of water column
- (e) How pressure is measured with the help of L.V.D.T. ?

**4. (A) Attempt any THREE :****12**

- (a) Describe working of C-type Bourdon tube with labelled diagram.
- (b) State the principle for ultrasonic method for level measurement & draw the diagram.
- (c) Explain with labelled diagram of cascade control system.
- (d) Draw diagram of electronic PID controller and explain.

**(B) Attempt any ONE :****06**

- (a) Draw diagram of Rotating Vane meter and explain working.
- (b) Draw the PLC architecture and explain each block in details.

**5. Attempt any FOUR :****16**

- (a) What is vacuum pressure ? What is the unit of its measurement & list method of vacuum pressure measurement.
- (b) Explain why valve sizing is important.
- (c) Explain single seated and double seated control valve.
- (d) Describe working of spring diaphragm actuator.
- (e) Draw & explain sight glass method of level measurement.
- (f) State one difference between variable head meter and variable area meter.

**6. Attempt any TWO :****16**

- (a) With a neat sketch, explain the construction and working of a D.C.S. system used in process industries.
  - (b) Explain inherent flow characteristics of control valve with diagram.
  - (c) What is ON-OFF control ? What is differential gap ? State any two instances where you will prefer ON-OFF control.
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