

(Time: 3 Hours)

[Total Marks: 80]

- N.B.: (1) Question No. 1 is **compulsory**.  
 (2) Solve any **three** questions out of remaining **five** questions.  
 (3) Assume suitable data if required.

Q 1 Write short notes on

- Basic Process control scheme with Diagram.
- Ultrasonic method for Level Measurement
- Ladder logic
- Explain Rupture Disc

[20]

Q 2 (a) A Piezoelectric sensor is made up of quartz. The voltage sensitivity for quartz is about 0.075 V/(m.Pa). How much pressure in bars should be applied, to create a potential difference of 15V, if the thickness of the material is 4cm?

[10]

(b) Explain Wheatstone bridge in detail

[10]

Q3 (a) Explain importance of calibration also explain calibration of rotameter

[10]

(b) Explain principle, construction and working of radiation pyrometer with neat diagram

[10]

Q4 (a) Draw a neat sketch to show the essential parts of Bourdon tube pressure gauge. Describe the purpose of each part. What are the two types of adjustments done in it?

[10]

(b) Describe with neat sketch the construction and working of linear variable differential transformer for pressure measurement with advantages and disadvantages

[10]

Q5 (a) Explain in detail PLC and give ladder logic for motor is on and after 5 min motor is off and light will glow.

[10]

(b) Explain LOPA and SIL Classification in detail.

[10]

Q 6 Write short notes on: (any four)

[20]

- Signal conditioning
- DAQ
- Explain Piezo-electric sensing elements.
- Explain various types of Instruments
- Explain any five sources of error that can occur with measurement system.

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