



Answer all the following questions.

Clear all your answers with drawing.

Question (1)

(10 Marks)

Define the following: sensitivity, accuracy, calibration, precision and uncertainty.

Question (2)

(10 Marks)

Explain the main components of measuring systems and give an example.

Question (3)

(10 Marks)

Explain the basic components of automatic control systems and give an example.

Question (4)

(10 Marks)

Describe and explain one method used to the control devices of the temperature (thermostat).

Question (5)

(15 Marks)

Sketch and describe the principle of operation and construction of the following:

- I. Piezo-electric transducers.
- II. Photo-conductive transducers.
- III. Electric Bridge Circuits.

Question (6)

(15 Marks)

Write notes in details:

- I. P. E Pneumatic electric relays.
- II. E. P Electric pneumatic relays
- III. Pneumatic actuators with sketch.

Question (7)

(10 Marks)

Explain with the sketch in detail one device used to measure the pressure.

Question (8)

(10 Marks)

Explain in detail with neat sketch one device used to measure the temperature.

Question (9)

(5 Marks)

Explain in detail with sketch one device used to measure the humidity.

Question (10)

(5 Marks)

A certain thermometer has a time constant of 15 sec and an initial temperature of 25°C . It is suddenly exposed to a temperature of 150°C . **Determine** the rise time, that is, the time to attain 95 percent of the steady-state value, and the temperature at this time.

With the best wishes

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