

MEIC - 105

M.E./M.Tech. I Semester

Examination, June 2013

Industrial and Process Instrumentation

Time : Three Hours

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Maximum Marks : 70

Note : 1. Attempt any five questions.

2. All questions carry equal marks.

1. a) What is Pitot tube? With the help of suitable diagram describe its use in flow measurement.
b) Compare the features of various Transducers.
2. a) Describe the construction and working of thermistors. Draw their resistivity versus temperature characteristics to show that they have a very high value of sensitivity with that of metals.
b) Describe the construction and working of an electromagnetic flame meter.
3. a) Describe the principle of operation of Piezoelectric type vibration transducer.
b) For a Piezoelectric transducer a flat frequency response within 10% is required. Find the value of minimum frequency at which it can be used, and the corresponding phase shift, given that the time constant of the circuit is 1.8 ms.

4. a) By the use of suitable example, explain with neat & clean sketch of feedback & feed forward control concepts.
b) How are P and I action realized in a pneumatic controller? How are these action varied in magnitude?
5. a) Describe in brief the different tuning schemes used for a PID controller.
b) Under what condition pneumatic controller are preferred over electronic controllers?
6. a) Draw the symbols for the following final control elements:
i) Control Valve
ii) Pneumatic actuator
iii) Motor actuator
iv) Heat exchanger
v) Orifice plate
b) Discuss about the important factors before selecting
i) air-to-close and
ii) air-to-open pneumatic control valve
7. a) Define 'bubble point' and 'dew point' in connection with distillation process.
b) Explain a control system using multiple coolants for temperature control in a reactor?
8. Write short notes on any two:
a) Pulp and Paper Plant
b) Measurement of Moisture
c) Process characteristics
d) Direct Digital Control