Total No. of printed pages = 3

CAI-3201/PC&I/6th Sem/2013/M

PROCESS CONTROL AND INSTRUMENTATION

Full Marks – 100

Pass Marks – 30

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer any *five* questions.

1. (a) How instruments are classified ? Discuss different types of instruments. 6

   (b) For a thermistor, β = 3140 K and the resistance at 27°C is known to be 1050Ω. If the thermistor is used for measuring a temperature of 6°C, find the resistance of the thermistor. 4

   (c) Define the terms. Give examples. 5×2=10

   (i) Primary transducer

   (ii) Secondary transducer

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(iii) Active transducer

(iv) Passive transducer

(v) Inverse transducer.

2. (a) What are the static performance characteristics? 10

(b) Draw the block diagram of the functional elements of an instrument and explain it. 10

3. Write short notes on the following : 5×4=20

(a) Resistance temperature detector

(b) Thermistor

(c) Elastic pressure transducer

(d) Ionisation gauge.

4. (a) Explain the working of mechanical absorption hygrometer. 8

(b) Explain electromagnetic flowmeter with neat sketch. 8

(c) Write the difference between Head Type flowmeter and Area Type flowmeter. 4

5. Explain briefly the following : 5×4=20

(a) Spectrophotometry

(b) Chromatography

(c) Bubbler or purge system level measurement

(d) Bio sensor.

6. (a) Discuss about reactors, evaporators and dryers. 15

(b) What are the different control actions ? 5

7. (a) What is automatic control system? Explain with block diagram. 10

(b) Explain the levels of process control system. 6

(c) Define pressure, viscosity, flow and moisture. 4