

Total No. of printed pages = 3

CAI-403/I&PC/4th Sem/2014/N

## INSTRUMENTATION AND PROCESS CONTROL

Full Marks – 70

Pass Marks – 28

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) What are performance characteristics ?  
Explain dynamic performance characteris-  
tics. 8
2. (a) With a neat sketch, explain the working of  
a thermocouple. What are its advantages and  
limitations ? 8
- (b) Compare RTD and Thermistor. 6

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3. (a) Explain the following :  $6+6=12$

(i) Bourdon tube pressure gauge

(ii) Ionization gauge.

(b) A platinum resistance thermometer has a resistance of  $100\Omega$  at  $0^\circ\text{C}$  and  $139.5\Omega$  at  $100^\circ\text{C}$ . If it is used to measure a temperature of  $400^\circ\text{C}$ , what is the resistance of platinum wire ? Take  $\alpha = 0.0039/^\circ\text{C}$ . 2

4. (a) Sketch and explain the working of a bubbler gauge. 7

(b) Explain about automatic control system with block diagram and suitable example. 7

5. (a) Explain the working principle of electromagnetic flowmeter with a neat sketch. 7

(b) Write short notes on Dryers and Evaporators. 7

6. (a) Explain the working of any one of the absorption hygrometers. 7

(b) Brief the levels of process control system. 7

7. (a) Define the term controller. What are the different control actions ? 6

(b) Explain the following : 4+4=8

(i) Bio-sensor

(ii) Gas-chromatography.