

Total No. of printed pages = 4

CAI-403/PC&I/4th Sem/2013/M

PROCESS CONTROL AND INSTRUMENTATION

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) What are performance characteristics ?
Explain static performance characteristics. 8
- (b) Define measurement errors and its
classification. 4
- (c) Explain speed of response and overshoot. 2
2. (a) What is transducer and its types ? 4

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- (b) A platinum resistance thermometer has a resistance of 100Ω at 0°C and 139.5Ω at 100°C . If it is used to measure a temperature of 500°C , what is the resistance of platinum wire ? Take $\alpha = 0.0039/^{\circ}\text{C}$. 3
- (c) How electrical instruments are classified and discuss about recording, indicating and integrated instruments. 7
3. Write short notes on the following :
- (a) Bi-metallic strip 3
- (b) Thermocouple 4
- (c) Bourdon tube pressure gauge 3
- (d) Ionisation gauge 4
4. (a) Explain the working of electrical absorption hygrometer. 5
- (b) What are head flowmeter and area flowmeter ? 4
- (c) Explain electromagnetic flowmeter with neat sketch. 5

5. Explain briefly the following :

- (a) Chromatography 3
- (b) Biosensor 4
- (c) Strain gauge used for force measurement. 3
- (d) Level measurement using capacitive sensor. 4

6. (a) Draw the block diagram of automatic controller and explain it. What are the different control actions ? 8

(b) Discuss about reactors and dryers. 6

7. Define the terms and give their units. (any seven) :

(a) Temperature

(b) Flow

(c) Humidity

(d) Moisture

(e) pH

(f) Torque

(g) Velocity

(h) Pressure

(i) Level

(j) Surface tension.

7×2=14