

Total No. of Questions : 8]

SEAT No. :

P4563

[4760]-118

[Total No. of Pages : 2

M.E.(Mech.) (Design Engineering)
INSTRUMENTATION & AUTOMATIC CONTROL
(2008 Pattern) (Elective-I) (Semester-I)

Time : 3 Hours]

[Max. Marks : 100

Instructions to the candidates:

- 1) Answers to the two sections should be written in separate answer books.*
- 2) Answer any three questions from each section.*
- 3) Neat diagrams must be drawn wherever necessary.*
- 4) Figures to the right side indicate full marks.*
- 5) Use of calculator is allowed.*

SECTION-I

- Q1) a)** Explain the significance of Parameter Estimation. **[8]**
- b) Discuss the significance of statistical methods used in experimentation. **[8]**
- Q2) a)** Compare RTD with thermocouples with respect to principle, sensor output, type and one application each. **[8]**
- b) Explain electromagnetic flow meter with respect to principle, schematic, sensor output and applications. **[8]**
- Q3) a)** Explain a suitable transducer to measure pressure with an electrical output signal. State applications of the transducer you discuss. **[8]**
- b) Explain a suitable method to measure mass flow rate. **[8]**
- Q4)** Write short notes on (any two): **[18]**
- a) Primary and secondary transducers.
 - b) Accuracy, precision and hysteresis.
 - c) Thermopiles.

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SECTION-II

- Q5)** a) With respect to principal, construction and working explain reluctance type magnetic pick up used for angular velocity measurement. [8]
- b) Explain the Op-Amp used to implement PI controller. Discuss the role of such controller used in temperature control system. [8]
- Q6)** Discuss in brief with respect to principle, construction, range, precision, cost the sensors used to measure flow measuring transducer/ transmitter. [16]
- Q7)** a) Define proportional, Integral and derivative control with mathematical equations. Discuss in brief the advantage of adding Integral control to proportional controller. [8]
- b) Explain why in Integral controllers are not used alone. Discuss the controller output in case of proportional plus Integral controller. [8]
- Q8)** Write short notes on (any three): [18]
- a) Pneumatic proportional controller using flapper valve.
 - b) Op-Amp used as voltage to current converter.
 - c) Humidity measurement.
 - d) Sensors to measure displacement.

