

(3 Hours)

[Total Marks : 100]

N.B. : (1) Question No. 1 is compulsory.

(2) Attempt any four out of remaining six questions.

1. (a) Define the following terms (any five) :— 10
 (i) Accuracy (ii) Precision (iii) Reproducibility (iv) Repeatability (v) Hysteresis (vi) Linearity.
 Explain each of the above with an example.
- (b) (i) What is a transducer ? How is a transducer different from a sensor ? 10
 (ii) What is fuzzy control ?
 (iii) Draw the circuit of electronic PID controller.
 (iv) Define gain factor of a piezoresistive transducer.
 (v) Explain dead time in a process.
2. (a) What are the different types of variable head flowmeters ? Explain with neat diagrams any two. 10
 (b) How is displacement measured ? State the different transducers used and explain any two in detail. 10
3. (a) Compare the following temperature transducers with respect to their characteristics, range of measurement and applications— 10
 RTD, Thermocouple and Thermistor.
- (b) Write a short note on vibration measurement. Draw a neat diagram of the measurement setup. 10
4. (a) Draw the measurement setup of pressure measurement system, where the diaphragm is used, the output from the system is desired as electrical voltage. 10
 (b) Why are signal conditioning circuits used in measurement systems ? Draw circuit and explain an instrumentation amplifier. State its advantages over other amplifier. 10
5. (a) How is a capacitive transducer used for level measurement, for conducting liquid and non conducting liquid. 10
 (b) Draw the block diagram of programmable logic controller and explain each block in detail, state the importance of the power supply module. 10
6. (a) What is a neural network ? What are the different methods of training a neural network ? 10
 (b) What are the different types of continuous controllers ? Explain each of them stating their advantages and disadvantages. 10
- 7.A Certain process control system has the following parameters being measured. 20
 (a) Pressure (b) Temperature (c) PH (d) Level.
 It is desired to require, monitor, display and log all the above data.
 Draw the setup desired.
 State the differences between a microprocessor based setup and computer based setup.