

- N.B. :** (1) Question No. 1 is **compulsory**.
(2) Attempt any **four** questions out of remaining **six** questions.
(3) Draw neat **sketches** wherever **necessary**.

1. Answer the following questions :- 20
- (a) Explain supervisory computer control in brief.
 - (b) Explain any one method of analog-to-digital conversion.
 - (c) Describe cascade control with a neat diagram.
 - (d) Write a short note on pressure sensors.
2. (a) Enumerate and discuss the various sources of error encountered in a measurement system. 10
- (b) Explain what you understand by the terms "accuracy" and "precision". 5
- (c) Explain the dynamic analysis of measurement systems. What is the need of obtaining mathematical models of measurement systems ? 5
3. (a) (i) Describe the different criteria for selection of transducers for a particular application. 5
- (ii) What are the various uses of capacitive transducers ? 5
- (b) Describe various methods to measure temperatures above 2000 °C in a system. 10
4. (a) With neat diagrams, explain any two configurations of a multi-channel data acquisition system. 10
- (b) What is a signal conditioner ? Explain any four signal conditioning circuits. 10
5. (a) Describe the need of a controller in process instrumentation industry with a suitable example. 6
- (b) Describe the operation of a Typical Electronic proportional + Integral + Derivative Controller and explain how the tuning of such a controller is carried out. 10
- (c) Explain the terms :- 4
- (i) Process lag
 - (ii) Control lag.
6. (a) With the help of a block diagram explain a PLC system. 12
- Describe the modes of operation of a PLC. State advantages of PLC over an analog controller.
- (b) Write a note on Fuzzy Control. 8
7. (a) What are neural networks ? Explain the various methods of training the neural networks. 10
- (b) What are data loggers ? With the help of a neat block diagram explain the function of each block in a data logger. 10