

- N.B. : (1) Question No.1 is compulsory.  
 (2) Attempt any four questions out of remaining six questions.

1. Answer the following questions:- [ 20 ]
- What is cold junction compensation in thermocouples?
  - Briefly explain the following
    - Direct digital control.
    - Supervisory computer control
  - Explain hair hygrometer.
  - What are data loggers?
2. (a) Explain construction, working and application of LVDT. What is residual voltage. [ 10 ]  
 (b) What is gauge factor? What are the advantages of using metal foil and deposited film types of strain gauges? Give a typical strain gauge attachment scheme that takes into account the temperature compensation, zero drift and environmental changes compensation. [ 10 ]
3. (a) What is data acquisition system. Draw and explain the block diagram for single channel and multichannel data acquisition system. [ 10 ]  
 (b) What are the different types of transducers used for level measurement? Explain any two in detail. [ 10 ]
4. (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 ]
5. (a) What is a PLC? Draw its block diagram and explain in detail the different modules. [ 10 ]  
 (b) What are the various signal conditioning circuits? Explain any four of these. [ 10 ]
6. (a) What is fuzzy control? Describe elements of fuzzy logic. State the advantages of fuzzy controller. [ 10 ]  
 (b) Explain tuning of PID controllers. [ 10 ]
7. (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) Write a short note on vibration measurement. [ 10 ]