

B.E. Instrumentation Engineering Seven Semester  
**IN701 – Instrumentation System Design**

P. Pages : 1

Time : Three Hours



**GUG/W/18/1825**

Max. Marks : 80

- Notes :
1. All questions carry marks as indicated.
  2. Due credit will be given to neatness and adequate dimensions.
  3. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) Elaborate the concept of cold junction compensation in thermocouples. List and explain any design of Cold Junction compensation. 8  
b) Discuss in brief calibration and installation procedure of RTD. 8  

**OR**
2. a) Illustrate the design considerations of temperature transducers. 8  
b) Distinguish the temperature sensors with the help of 8
  - i) Range
  - ii) Accuracy
  - iii) Sensitivity
  - iv) Input – output characteristics.
3. a) List and discuss in brief about the selection criteria for flow measurement. 8  
b) Discuss in detail design of square root extractor. 8  

**OR**
4. a) Illustrate the concept of span and zero with respect to transmitters. 8  
b) Illustrate in brief the concept of SMART Transmitter. 8
5. a) Discuss selection criteria for pressure transducer. 8  
b) List and discuss factors affecting sensitivity of pressure transducer. 8  

**OR**
6. a) Draw and discuss level measurement and its signal conditioning circuit. 8  
b) Illustrate in detail, the design consideration of I/P and P/I convertor. 8
7. a) Describe valve selection and sizing of control valve for liquid service. 8  
b) Draw and discuss characteristics of control valve. 8  

**OR**
8. a) Elaborate the concept of ‘Cavitation’ and ‘Flashing’ in control valve. 8  
b) Enlist different type of pumps and describe its characteristics. 8
9. a) Discuss in brief reliability concepts and causes of failure. 8  
b) Design microprocessor based Data Acquisition System. 8  

**OR**
10. a) Design and discuss Alarm Annunciator system. 8  
b) Define with respect to reliability the following terms. 8
  - i) MTTF
  - ii) MTBF
  - iii) MTTR
  - iv) Redundancy and redundant system.

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