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**Question Paper Code: 37502**

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Seventh Semester

Electronics and Instrumentation Engineering

01UEI702 - INSTRUMENTATION SYSTEM DESIGN

(Regulation 2013)


Duration: One hour

Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

**(Answer any six of the following questions)**

1. In a bridge circuit, if the range of resistance variation is small and centered about the null value, then the nonlinearity of voltage versus resistance is
  - (a) Large
  - (b) Small
  - (c) Infinity
  - (d) Unity
2. Isolation Amplifiers are used to provide
  - (a) High sensitivity
  - (b) Improved stability
  - (c) Electric safety
  - (d) error suppression
3. Schering bridge is used to measure
  - (a) Capacitance
  - (b) Potential difference
  - (c) Resistance
  - (d) Inductance
4. Zero suppression is done in transmitters to improve
  - (a) Accuracy
  - (b) Stability
  - (c) Linearity
  - (d) Sensitivity
5. A PI controller has the transfer function  $5 + (1/s)$  with the unit of time expressed in minutes. The parameters proportional band and reset time for the above controller are respectively
  - (a) 20% and 0.2 min
  - (b) 20% and 0.2 min
  - (c) 20% and 5 min
  - (d) 50% and 5 min

6. In case of an on-off controller, the proportional band is
- (a) 100% (b) Infinity  
(c) Zero (d) Unity
7. A pressure instrument is calibrated from 100 to 600 psi. The span of this instrument is
- (a) 600 (b) 100 (c) 400 (d) 500
8. Rotameter is a
- (a) Variable head flow meter (b) Variable area flow meter  
(c) Electro Magnetic flow meter (d) Target flow meter
9. The given symbol appears in an instrument diagram, It represents a 
- (a) Flow rate controller (b) Frequency converter  
(c) Fixed control point (d) Final control element
10. The signal Flow directions between instruments in a plant is given
- (a) Instrument specification sheet (b) Piping and instrumentation diagram  
(c) Process flow sheet (d) Instrument index sheet

PART – B (3 x 8= 24 Marks)

**(Answer any three of the following questions)**

11. How the Wheatstone bridge can be balanced? Explain the balance measurement techniques in detail. (8)
12. Explain the measurement of capacitance using AC bridges. (8)
13. Explain the operations of P, PI and PID controllers in detail. Brief the characteristics of each controller. (8)
14. Explain the design consideration of rotameter in detail with necessary diagrams and equations. (8)
15. Draw the Process Instrumentation (PI) diagrams of the following: (i) Valves (ii) Compressors (iii) Pumps and Turbine and (iv) Line symbols. (8)