Reg. No. : | | | | | | | | | | |

Question Paper Code: 37502

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2018

Seventh Semester

Electronics and Instrumentation Engineering

01UEI702 - INSTRUMENTATION SYSTEM DESIGN

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. Draw the circuit diagram of differential amplifier based on single op-amp and four matched resistors.
2. Define sensitivity of a wheat stone bridge.
3. How the specific signal conditioner for capacitive sensors works?
4. Draw the simple phase sensitive detector circuit.
5. What is proportional band?
6. Discuss the need for designing Two-position controller action with neutral zone.
7. Draw the orifice type flow meter and indicate the fluid flow.
8. Write a note on square root extractors.
9. Draw the Process and Instrumentation (PI) diagram of a flow process.
10. Define piping and instrumentation diagram.

PART - B (5 x 16 = 80 Marks)

11. (a) How the Wheatstone bridge can be balanced? Explain the balance measurement techniques in detail. (16)

Or

(b) Design an instrumentation amplifier with its merits and application. (16)

12. (a) Design an ac amplifier with power supply decoupling and explicate the step by step design procedure with diagrams and equations. (16)

Or

(b) Describe the application and working of LVDT used in signal conditioning with appropriate diagrams. (16)

13. (a) Explain the design and implementation of electronic PID controller. (16)

Or

(b) Explain the operations of P, PI and PID controllers in detail. Brief the characteristics of each controller. (16)

14. (a) Describe the procedural steps for Bourdon tube design. Discuss also the factors which affect its sensitivity. (16)

Or

(b) Explain the design consideration of rotameter in detail with necessary diagrams and equations. (16)

15. (a) Discuss about the instrument specification sheets for flow and pressure. (16)

Or

(b) (i) Explain with an example the process flow sheet. (10)

(ii) Discuss about the preparation of Instrumentation project. (6)