

M. TECH.**(SEM II) THEORY EXAMINATION 2018-19
ADVANCED INSTRUMENTATION CONTROL****Time: 3 Hours****Total Marks: 70****Note: 1.** Attempt all Sections. If require any missing data; then choose suitably.**SECTION A**

- 1. Attempt all questions in brief. 2 x 7 = 14**
- What are the basic elements of a generalized instrumentation system?
 - Discuss open loop response for unit step input.
 - Define transducers with examples.
 - What are semiconductor sensors?
 - Differentiate between variable conversion elements and variable manipulation elements.
 - List the various applications of programmable logic controller.
 - What are the different types of controllers used in control systems?

SECTION B

- 2. Attempt any three of the following: 7 x 3 = 21**
- Describe construction and design of strain gauge. What are the uses of these transducers?
 - Draw the block diagram of a d.c.signal conditioning system and explain the functions of each block.
 - State the advantages and limitations of state model using phase variables.
 - Why is distributed control necessary in automation of energy distribution system?
 - What are the basic elements of a generalized measurement system, explain in detail?

SECTION C

- 3. Attempt any one part of the following: 7 x 1 = 7**
- Describe the different electrical method for measurement of liquid level. Compare their advantages and disadvantages.
 - Differentiate between active and passive transducers with the help of suitable examples.
- 4. Attempt any one part of the following: 7 x 1 = 7**
- Describe one method of digital to analog conversion (D/A).
 - Describe how with the use of operational amplifiers we can get a linear response between output voltage and input displacement when the capacitive transducers are used in a mode where the variation of capacitance with distance between the plates.
- 5. Attempt any one part of the following: 7 x 1 = 7**
- Write a brief note on advanced control techniques with the help of suitable block diagram.
 - What is cascade and ratio control schemes?
- 6. Attempt any one part of the following: 7 x 1 = 7**
- State the various properties of state transition matrix.
 - Discuss with optimum controller settings of damped oscillation method.
- 7. Attempt any one part of the following: 7 x 1 = 7**
- What are the basic modules of a PLC? Explain any one industrial application of PLC in detail.
 - What do you mean by tuning of multivariable controllers?