

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
Eighth Semester B.Tech. Degree Examinations, September 2020

Course Code: EE404

Course Name: INDUSTRIAL INSTRUMENTATION AND AUTOMATION

Max. Marks: 100

Duration: 3 Hours

PART A

Answer all questions, each carries 5 marks.

Marks

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| 1 | List any five factors affecting choice of transducer. | (5) |
| 2 | Explain the principle of variable reluctance tachometer. | (5) |
| 3 | Explain the working of instrumentation amplifier with basic circuit diagram. | (5) |
| 4 | Explain MEMS accelerometer. List its advantages and disadvantages compared to normal sensors. | (5) |
| 5 | Which are the commonly used actuators and how they are selected for a particular process control application? | (5) |
| 6 | What are the various types of automation used in industrial process? | (5) |
| 7 | Explain about the different types of timers used in PLC. | (5) |
| 8 | What is Distributed control system? Also state the difference between DCS and SCADA in process control. | (5) |

PART B

Answer any two full questions, each carries 10 marks.

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| 9 | a) Explain the block diagram representation of a process control system. | (6) |
| | b) Describe the working of analog and digital phase detectors with suitable diagrams. | (4) |
| 10 | a) What are the factors influencing the selection of a transducer? | (4) |
| | b) With neat diagram explain the working of a LVDT transducer, give any one application of LVDT. | (6) |
| 11 | a) Describe any two methods used for the measurement of linear and torsional displacement. | (6) |
| | b) Explain the working of hot wire anemometer. | (4) |

PART C

Answer any two full questions, each carries 10 marks.

- 12 (a) Describe the steps involved in bulk micromachining fabrication of MEMS. (6)
(b) List any four types of MEMS actuators along with their applications. (4)
- 13 (a) How is photolithography used in the micro machining process of MEMS. (6)
(b) Compare Dry and wet etching in micromachining of MEMS. (4)
- 14 (a) Explain the concept of graphical programming in virtual instruments. (7)
(b) List the techniques used in micromachining. (3)

PART D

Answer any two full questions, each carries 10 marks.

- 15 a) Explain the concept of latching in PLC. Draw the ladder diagram for realising AND & OR logic using PLC. (6)
b) Explain the different input output used in PLC. (4)
- 16 a) Explain with an example the working of counters in PLC. (6)
b) Describe the various electrical actuators used in automation. (4)
- 17 a) Explain the architecture of an industrial automation system. (6)
b) Explain the working principle of a pneumatic actuator. (4)
