

B

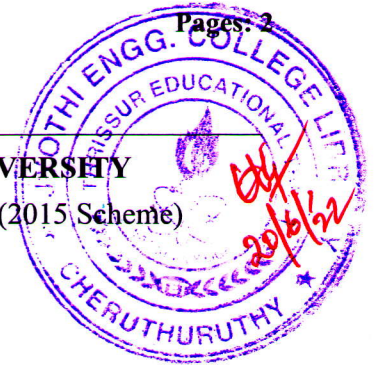
04000EE404052104

Pages: 2

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
Eighth Semester B.Tech Degree Examination June 2022 (2015 Scheme)



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

- 1 Draw the step response of a first order sensor. Explain the effect of time constant on the nature of response of the sensor. (5)
- 2 Explain shaft torque measurement using strain gauge. (5)
- 3 How can you realize a resistor using switched capacitor circuits? Explain with suitable diagram. (5)
- 4 Differentiate between bulk and surface micromachining process (5)
- 5 Explain shape memory alloys. (5)
- 6 List any five advantages of industrial automation. (5)
- 7 Explain PLC architecture. (5)
- 8 Draw the PLC ladder diagrams to realize two input AND, OR and XOR gates. (5)

PART B

Answer any two full questions, each carries 10 marks.

- 9 a) Draw the block diagram representation of a process control system and explain the function of each block. (6)
- b) Explain the transfer characteristics of a transducer due to scale error. (4)
- 10 a) Explain the different methods of flow measurement using hot wire anemometer. (6)
- b) List any two advantages and disadvantages of resistive transducer. (4)
- 11 a) With the help of diagram explain the self-regulating process. (5)
- b) Explain digital phase detector. (5)

PART C

Answer any two full questions, each carries 10 marks.

- 12 a) With the help of a circuit diagram, explain how bridge can be linearization can be achieved using op amps. (6)
- b) Explain the purpose of signal conditioning in instrumentation systems. (4)

- 13 a) Explain the principle of MEMS accelerometer. (6)
b) Compare virtual and traditional instrument process. (4)
- 14 a) Explain the working of Precision rectifier. (5)
b) Illustrate photolithography in micromachining. (5)

PART D

Answer any two full questions, each carries 10 marks.

- 15 a) Explain the architecture of automation system. (6)
b) Explain classification of control valves based on number of plugs. (4)
- 16 a) Explain architecture of SCADA with the help of a diagram. (5)
b) Explain different Counter parameters of PLC (5)
- 17 a) What is the role of actuators in automation system? How are they classified based on source of energy? (5)
b) What is CNC? Mention advantages and disadvantages. (5)
