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17MT54

Fifth Semester B.E. Degree Examination, Feb./Mar. 2022 Micro and Smart Systems Technology

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Define Smart system and explain Typical smart system, with neat block diagram. (08 Marks)
b. Explain the operation of ADXL50 Accelerometer, with neat schematic diagram. (12 Marks)

OR

- 2 a. Classify and explain integrated micro-system. (08 Marks)
b. Explain the need of Miniaturization. (12 Marks)

Module-2

- 3 a. Explain Piezoresistive pressure sensor with schematic. (10 Marks)
b. Explain the operation of Piezo-electric Inkjet Actuator with neat diagram. (10 Marks)

OR

- 4 a. Describe a magnetic microrelay with schematic and materials used. (10 Marks)
b. Explain the operation of an electrostatic comb drive with its fabrication process and materials used. (10 Marks)

Module-3

- 5 a. Explain Chemical Vapour Deposition (DVD) Technique with reaction chamber and relevant chemical reactions. (10 Marks)
b. Explain step involved in the lift off process of patterning in micro-systems. (10 Marks)

OR

- 6 a. Explain the process of photo-lithography with neat schematic diagrams. (10 Marks)
b. Explain the various steps involved in the fabrication of micro systems. (10 Marks)

Module-4

- 7 a. Implement inverter, NAND gate using CMOS Logic circuits and outline the operations using Truth Table of operation. (10 Marks)
b. Explain P-N junction diode along with diagram and V-I characteristics graph. (10 Marks)

OR

- 8 a. Explain the operation of Schottky Diode and Tunnel Diode with VI characteristics. (10 Marks)
b. Explain the three modes of operations of a MOSFET with relevant equations. (10 Marks)

Module-5

- 9 a. Explain micro-controllers used in digital control with suitable internal block diagram. (10 Marks)
b. Describe a proportional Integral Derivative Controller. (10 Marks)

OR

- 10 a. Explain case study of vibrations in Beams with neat diagram. (10 Marks)
b. Discuss performance parameter of pressure sensor relevant to sensitivity, non-linearity with neat characteristics curves. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.