



Fifth Semester B.E. Degree Examination, June/July 2024 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. Classify and explain integrated Microsystems. (10 Marks)
- b. Explain briefly the application of micro systems in various fields. (10 Marks)

OR

- 2 a. Sketch and explain micro fabrication. (10 Marks)
- b. Differentiate between micro electronics and micro systems. (10 Marks)

Module-2

- 3 a. Explain the operation of piezo electric inject actuator with neat diagram. (10 Marks)
- b. Explain the operation of an electrostatic comb drive with its fabrication process and material used. (10 Marks)

OR

- 4 a. Explain piezo resistive pressure sensor with schematic. (10 Marks)
- b. Describe a magnetic micro relay with schematic and material used. (10 Marks)

Module-3

- 5 a. Explain sputtering and evaporation techniques with sketches. (10 Marks)
- b. Explain steps involved in the lift off process of patterning in micro systems. (10 Marks)

OR

- 6 a. Explain etching process in micro systems. (10 Marks)
- b. Explain the process of photo lithography with schematic diagrams. (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 the operation of Schottky diode, Semiconductor diode and Tunnel diode with VI characteristics. (10 Marks)

OR

- 8 a. Explain the three modes of operations of a MOSFET with relevant equations. (10 Marks)
- b. Explain differential amplifier using op-amp (10 Marks)

Module-5

- 9 a. With a neat block diagram, explain PID controllers. (10 Marks)
- b. Explain micro controller used in digital control with a neat block diagram (10 Marks)

OR

- 10 a. Explain digital control system with a neat block 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.