



CBCS SCHEME

18MT55

Fifth Semester B.E. Degree Examination, Dec.2024/Jan.2025

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. Explain briefly the need for miniaturization. (10 Marks)
- b. Define smart materials. Explain typical smart system with neat block diagram. (10 Marks)

OR

- 2 a. Explain major groups of integrated microsystems. (10 Marks)
- b. Discuss the applications of smart materials and Microsystems. (10 Marks)

Module-2

- 3 a. With schematic explain piezoresistive pressure sensor. (10 Marks)
- b. Explain the materials used, fabrication process and principle of operation of an electrostatic comb drive. (10 Marks)

OR

- 4 a. Describe a magnetic microrelay with schematic and materials used. (10 Marks)
- b. Enumerate the working principle of a Piezoelectric inkjet print-head and mention any 2 applications of it. (10 Marks)

Module-3

- 5 a. With a neat diagram, explain the Key process involved in Photolithography. (10 Marks)
- b. Explain the steps in the lift – off process of patterning. Mention the major difference between Lithography and lift – off based patterning. (10 Marks)

OR

- 6 a. With a neat flow diagram, explain the steps involved in Fabrication of Micromachining. (10 Marks)
- b. Explain the process for realizing a Cantilever beam using Surface micromachining technique. (10 Marks)

Module-4

- 7 a. Along with V-I characteristic graph explain the looking of a p-n junction diode. (10 Marks)
- b. With equations explain the three modes of operations of a MOSFET. (10 Marks)

OR

- 8 a. Derive the output voltage for a op-amp difference amplifier. (10 Marks)
- b. Explain the working of phase locked loop with block diagram. (10 Marks)

Module-5

- 9 a. With a neat diagram, explain PID controller. (10 Marks)
- b. Discuss the operation of airbag trigger system in automobiles using microcontroller. (10 Marks)

OR

- 10 a. Explain briefly the vibration in beams. (10 Marks)
- b. Write short note on : i) Digital controllers ii) Microcontroller. (10 Marks)

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