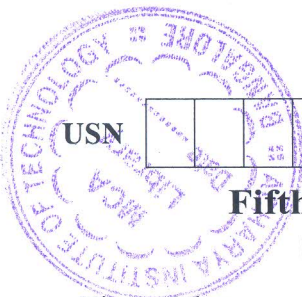


CBCS SCHEME



18MT55

Fifth Semester B.E. Degree Examination, June/July 2023 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. Explain briefly the features of Silicon capacitive accelerometer and mention its advantages. (10 Marks)
b. Explain conductometric gas sensor with relevant details and mention its applications. (10 Marks)

OR

- 4 a. Explain the operation of electrostatic comb drive with relevant diagram and mention its applications. (10 Marks)
b. Explain with relevant diagram the operation of piezoelectric inkjet print head and mention its applications. (10 Marks)

Module-3

- 5 a. Discuss some properties of silicon as a materials for micromachining. (10 Marks)
b. Explain the steps in the lift off technique using a neat diagram. (10 Marks)

OR

- 6 a. With a neat diagram, explain chemical vapor deposition technique. (10 Marks)
b. With neat diagram, explain surface micromachining to realize cantilever structure. (10 Marks)

Module-4

- 7 a. Explain the operation of a p-n junction diode with its symbol and V-I characteristics. (10 Marks)
b. With neat diagram, explain the operation of CMOS logic circuit as an inverter. (10 Marks)

OR

- 8 a. Explain the operation of a bipolar junction transistor with its symbol and V-I characteristics. (10 Marks)
b. Discuss six examples of Opamp based circuits with circuit diagram and applications. (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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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.