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18MT55

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. Explain miniaturization. (04 Marks)
b. With flow chart explain Microsystems versus MEMS. (08 Marks)
c. Sketch and explain micro fabrication. (08 Marks)

OR

- 2 a. Explain smart materials, structure and system. (07 Marks)
b. Explain with a neat sketch integrated Microsystems. (07 Marks)
c. Explain application of smart materials and Microsystems. (06 Marks)

Module-2

- 3 a. Define sensors, actuators and systems. (06 Marks)
b. Explain with a neat sketch silicon capacitive accelerometer. (07 Marks)
c. Explain with neat sketch portable blood analyzer. (07 Marks)

OR

- 4 a. Explain principle operation of micro mirror array for video projection and piezoelectric based Inkjet print head. (08 Marks)
b. Sketch and explain electrostatic comb-drive and magnetic micro relay. (12 Marks)

Module-3

- 5 a. Explain silicon as a material for micro machining. (06 Marks)
b. Explain silicon wafer preparation. (07 Marks)
c. With neat sketch explain thin film deposition techniques. (07 Marks)

OR

- 6 a. Explain isotropic Etching and anisotropic Etching. (06 Marks)
b. Explain Lithography. (07 Marks)
c. Sketch and explain bulk micro machining. (07 Marks)

Module-4

- 7 a. With a neat sketch, explain semiconductor diode. (07 Marks)
b. Explain with a neat sketch bipolar junction transistor. (08 Marks)
c. Write short note on tunnel diode. (05 Marks)

OR

- 8 a. With a neat circuit, explain CMOS circuits. (07 Marks)
b. Explain electronics amplifiers. (07 Marks)
c. Explain Op-Amp circuits with neat circuits. (06 Marks)

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.

18MT55

Module-5

- 9 a. Explain PID controller.
b. Sketch and explain digital controller.
c. Explain microcontroller and PLC.

(07 Marks)

(07 Marks)

(06 Marks)

OR

- 10 Write short notes on :
a. BEL pressure sensor
b. Circuit implementation
c. Design considerations
d. Performance parameters
e. Smart structure in vibration control.

(20 Marks)

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