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Date.....

Time: 3 hrs.

10MT63

Sixth Semester B.E. Degree Examination, Dec.2019/Jan.2020

**Micro and Smart Systems Technology**

Max. Marks:100

**Note: Answer any FIVE full questions, selecting at least TWO questions from each part.**

**PART – A**

- 1 a. Discuss the Evaluation of Micro-fabrication and smart material. (10 Marks)  
b. In detail highlight the applications of microsystems. (10 Marks)
- 2 a. With a neat diagram, discuss the principle of operation of silicon capacitive accelerometer. (10 Marks)  
b. Discuss the working of piezo-resistive pressure sensor and its applications. (10 Marks)
- 3 a. With a neat diagram, explain the process of photolithography. (10 Marks)  
b. Differentiate between Wet and Dry etching methods used in microtechnology. (05 Marks)  
c. Write a short note on Thick – film processing. (05 Marks)
- 4 a. Discuss the detail scaling of magnetic forces and electro static forces. (10 Marks)  
b. Explain the scaling issues while modeling the micro systems. (10 Marks)

**PART – B**

- 5 a. Explain the Finite element method in detail. (10 Marks)  
b. With neat diagram and necessary equation illustrate the actuation effect in a piezoelectric plate. (10 Marks)
- 6 a. Explain switched capacitor circuits for capacitance measurement. (10 Marks)  
b. With a neat diagram, explain the characteristics of Instrumentation amplifiers. (10 Marks)
- 7 a. Explain the issues in microsystem packaging. (10 Marks)  
b. Discuss the following packaging Technologies (10 Marks)  
i) Ball grid array ii) Wire bonding.
- 8 a. Explain the working of a piezo resistive pressure sensor and define the terms sensitivity and offset voltage. Draw the diagram at necessary places. (10 Marks)  
b. Explain the micro-machined accelerometer with neat diagram. (06 Marks)  
c. Draw the circuit diagram of MOSFET integrated pressure sensor. Explain the operation. (04 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.