CBCS SCHEME

USN | | | | | | | | | | |

Fifth Semester B.E. Degree Examination, July/August 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. Outline Feynman's vision and Discuss the needs for Miniaturization. **(08 Marks)**
　　b. Explain the operation of ADXL50 Accelerometer, with neat schematic diagram. **(12 Marks)**

OR

2　a. Outline the applications of smart materials and Microsystems. **(10 Marks)**
　　b. Explain the need of miniaturization of devices. **(10 Marks)**

Module-2

3　a. Explain the salient features of sensors and actuators. **(10 Marks)**
　　b. Briefly explain Silicon capacitive accelerometer and piezoresistive pressure sensor. **(10 Marks)**

OR

4　a. Define a Relay, discuss different types of Relays with their features and explain the operation of Magnetic Micro Relay, with neat diagram. **(08 Marks)**
　　b. Define Piezoelectric effect and explain the operation of Piezo electric inkjet Actuator with neat diagram. **(12 Marks)**

Module-3

5　a. Explain chemical vapor deposition technique. **(10 Marks)**
　　b. Describe the lift-off technique of patterning. **(10 Marks)**

OR

6　a. Explain the process of thermal oxidation. **(10 Marks)**
　　b. Explain the specialized materials used for Microsystems. **(10 Marks)**

Module-4

7　a. Explain the operation of Normal Diode, Schottky Diode and Tunnel Diode with Junction diagrams, VI characteristics and relevant detail. **(10 Marks)**
　　b. Implement Inverter, NAND gate using CMOS Logic circuits and outline the operation using Truth Table of operation. **(10 Marks)**

OR

8　a. Draw the circuit and mention the applications of non inverting amplifier, voltage follower, integrator, differentiator and transimpedence amplifier along with output equations. **(10 Marks)**
　　b. Derive the output equation for a Opamp difference amplifier. **(10 Marks)**

Module-5

9　a. With block diagram, explain PID controller. **(10 Marks)**
　　b. Briefly explain integration of pressure sensor and smart structure in vibration control. **(10 Marks)**

OR

10　a. Explain the advantages of PID controllers and its application. **(10 Marks)**
　　b. Explain Design Methodology of controllers. **(10 Marks)**

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