Fifth Semester B.E. Degree Examination, July/August 2021
Micro and Smart Systems Technology

Time: 3 hrs.   Max. Marks:100

Note: *Answer any FIVE full questions.*

1 a. Explain the need of miniaturization. **(10 Marks)**
   b. Describe the typical structure of a smart system along with the general requirements expected of Microsystems. **(10 Marks)**

2 a. Explain briefly the application of Microsystems in various fields. **(10 Marks)**
   b. Classify and explain integrated Microsystems. **(10 Marks)**

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)**

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)**

5 a. Classify thin film deposition techniques. Explain sputtering and evaporation techniques with sketches. **(10 Marks)**
   b. Explain the various steps involved in the fabrication of microsystems. **(10 Marks)**

6 a. Explain LIGA process in Microsystems. **(10 Marks)**
   b. Explain steps involved in the lift–off process of patterning in Microsystems. **(10 Marks)**

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)**

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)**

9 a. Describe a proportional integral derivative controller. **(10 Marks)**
   b. Explain with block diagram a digital control system. **(10 Marks)**

10 a. Explain microcontrollers used in digital control. **(10 Marks)**
   b. Briefly explain the design methodology in implementation of controllers and also explain PLC. **(10 Marks)**

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