Seventh Semester B.Tech. Degree Examination, July 2019
(2013 Scheme)
13.706.2 : MEMS (AT)
(Elective IV)

Time : 3 Hours
Max. Marks : 100

PART – A

Answer all questions : Each question carries 2 marks

1. Define MEMS.
2. What is meant by Anisotropic Wet Etching?
3. Define tensile stress and tensile strain.
4. Define Spring Constant. What is its relevance in MEMS.
5. What is the principle of Electrostatic sensing?
6. Name any three thermal sensors.
7. Write a brief note on PDMS.
8. Write the principle of magnetic actuator with an example.
9. Explain the need for Thermal Sensing.
10. Give the principle of Flow Rate sensor.

(10 \times 2 = 20 Marks)

P.T.O.
PART – B

Answer any one full questions from each Module. Each question carries 20 marks

Module – I

11. (a) Describe the rules of anisotropic etching for a Simple Structures. 10
(b) Describe the rules of anisotropic etching for Complex Structures. 10

OR

12. Explain (a) DRIE Process 10
(b) Surface micromachining process 10

Module – II

13. (a) Define beam. Name the types of beams and point out the possible boundary conditions. 5
(b) Describe the flexural beam bending analysis under simple loading conditions. 15

OR

14. (a) Give the schematic diagram of a fixed free cantilever beam spring under loading condition. 5
(b) Describe the mechanical deformation of a coil spring under a point loading force 15

Module – III

15. (a) With suitable diagram, explain the working principle of parallel plate capacitor and the equilibrium position of electrostatic actuator under bias. 10
(b) Describe the pull in effect of parallel plate actuators. 10

OR

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16. (a) With schematic diagram, explain bulk micromachined parallel plate capacitor as differential mode tactile sensor  10
(b) Summarize the applications of comb drive devices.  10

Module – IV

17. (a) Discuss the properties of the materials used in the fabrication of piezoelectric sensors.  10
(b) With neat diagram, describe the fabrication process of PZT piezoelectric acoustic sensor.  10

OR

18. Give notes on: (a) Polymide (b) LCP.  20