Seventh Semester B.Tech. Degree Examination, October 2018
(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. Enumerate the essential components of MEMS.
2. What is meant by Anisotropic Wet Etching?
3. What are the different types of beams in MEMS? Draw relevant figures.
4. Define spring constant. What is its relevance in MEMS?
5. Summarize the advantages of electrostatic sensing and actuation.
6. Name any three thermal sensors.
7. Give the principle of tactile sensor with an example.
8. Write the principle of magnetic actuator with an example.
9. What is meant by PMMA? Give its three properties.
10. Give the principle of flow rate sensor.

PART – B

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

Module – I

11. i) Describe the etch profile evolution in anisotropic wet etching using relevant figures.
    10
   ii) Explain the steps in surface micromachining using relevant figures.
    10
   OR

12. i) Explain the properties of various chemicals used for anisotropic wet etching.
    10
   ii) Illustrate the DRIE process with relevant figures.
    10
Module – II


OR

14. i) Give the schematic diagram of a fixed free cantilever beam spring under loading condition.  

ii) Describe the mechanical deformation of a coil spring under a point loading force.

Module – III

15. i) Compare and contrast the characteristics of electrostatic and thermal bimetallic actuation.  

ii) Explain the working principle of infrared sensors with necessary diagrams.  

OR

16. i) With schematic diagram, explain bulk micro machined parallel plate capacitor sensing as differential mode tactile sensor.  

ii) Summarize the applications of comb drive devices.

Module – IV

17. i) Summarize the fabrication process of silicon accelerometer with parylene beams.  

ii) Describe Fluorocarbon and PMMA in detail.  

OR

18. i) Give short notes on : i) Polymide ii) LCP.  

ii) Describe the principle of piezoelectrics sensing with relevant figures.