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5592

Reg. No. :

Name :

**Seventh Semester B.Tech. Degree Examination, October 2014
(2008 Scheme)**

08.736 (Elective – IV) MEMS (TA)

Time : 3 Hours

Max. Marks : 100

PART – A



Answer **all** questions. **Each** question carries **4** marks.

1. Why is semiconductor preferred as substrate in MEMS ?
2. State the need for packaging.
3. Briefly explain the principle of operation of electrostatic scratch drive actuator used in MEMS devices.
4. How is the pressure converted into electrical signal in pressure sensor ?
5. List various types of accelerometer used in MEMS technology.
6. Compare micro system and microelectronics system.
7. What are the advantages and disadvantages of using piezo resistors ?
8. "Silicon and its compounds are used as ideal substrate materials for MEMS". Justify.
9. Explain photolithography.
10. Explain two types of scaling laws.

(10×4=40 Marks)

P.T.O.



PART – B

Answer **any two** questions from **each** Module. **Each** question carries **10** marks.

Module – I

11. List various actuation methods used in MEMS. Describe the principle of any two methods.
12. Describe with a neat schematic diagram the principle of micro accelerometer.
13. Calculate the electrostatic force on the plate electrodes with a applied dc voltage at 70 V. Two square plates with the dimensions as 1000 μm each are used. Two plates are initially misaligned by 20 percent in both length and width directions. Pyrex glass is used as dielectric material.

Module – II

14. With the help of sketches explain the process of ion implantation.
15. Enumerate various substrate materials used in MEMS.
16. Describe various steps in LIGA process with neat diagrams.

Module – III

17. Describe various methods of die-attachment with neat sketches.
 18. List and explain the design consideration of microsystem.
 19. Explain the three levels of microsystem packaging. **(6×10=60 Marks)**
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