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7772

Reg. No. :

Name :

**Seventh Semester B.Tech. Degree Examination, November 2015
(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. Illustrate the working of a micro accelerometer with the help of a neat diagram.
2. Explain the process of ion implantation with the help of block schematic.
3. Explain why isotropic etching is hardly used in micromanufacturing.
4. What are shape memory alloys ? List any two applications.
5. Discuss the applications of MEMS in automobile industry.
6. What are the properties of Silicon Nitride that make it attractive for MEMS and micro systems ?
7. Discuss the importance of signal mapping in micro systems.
8. Explain the three levels of micro system packaging, in brief.
9. Write notes on optical MEMS.
10. Discuss the issues involved in designing interfaces between MEMS components and their operating environment.

(10×4=40 Marks)

P.T.O.



PART – B

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

Module – I

11. Explain the principle of operation of a) thermal and b) piezoelectric microactuators.
12. a) Explain Trimmer Force Scaling Vector.
b) Use scaling laws to estimate the changes in acceleration a and time t to actuate a MEMS component if its weight is reduced by 10.
13. Explain the working of the following MEMS components
a) Micro pumps b) Micro grippers.

Module – II

14. a) Explain Chemical Vapour Deposition used for obtaining Silicon Nitride thin film over Silicon substrate.
b) Compare CVD with physical vapour deposition (4 relevant points).
15. Explain the LIGA process in detail.
16. Explain the steps involved in photolithographic process, for positive and negative photoresists.

Module – III

17. Discuss the major constraints in micro system design.
18. Explain the design of a silicon die for a micropressure sensor.
19. Explain the working of any two RF MEMS components and give their applications.

(6×10=60 Marks)