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B.E. / B.Tech. (Full Time) DEGREE ARREAR EXAMINATIONS, NOV/DEC 2011
ELECTRICAL AND ELECTRONICS ENGINEERING BRANCH
SIXTH SEMESTER
EE 9040 – MICRO ELECTRO MECHANICAL SYSTEMS
(REGULATIONS 2008)

PART – A (10 x 2 = 20 Marks)

1. Distinguish between the MEMS technology with microelectronics with respect to their applications.
2. Wafer bonding is part of which process of MEMS technology?
3. A piezoelectric crystal with piezo electric coefficient 500×10^{-12} m/V undergoes a mechanical strain equal to 125×10^{-5} m/m. Calculate the induced voltage per meter in the crystal.
4. What is the use of silicon dioxide in MEMS fabrication process?
5. Name any two chemical sensors.
6. What is a smart sensor?
7. On what principle does a microvalve function?
8. State any one application of microgrippers.
9. What is called MEOMS technology?
10. Where are 3D electro magnetic actuators used?

PART – B (5 x 16 = 80 Marks)

- 11 a) i). Write short notes on isotropic and anisotropic etching process. [8]
 - 11 a) ii). Explain the fabrication method that is used to produce high geometric aspect ratio MEMS devices. [8]
 - 12 a). Discuss in detail the surface micromachining technique.
- (or)
- 12 b). What are the different materials used in MEMS fabrication processes and explain each one of their properties and application.

13 a). Name any one biosensor in field application and explain its working principle.

(or)

13. b). Explain in detail the function of mechanical sensors in automotive applications with necessary pictures.

14. a). Explain the operation of inkjet printer based on piezoelectric effect.

(or)

14. b). Draw the picture of electrothermal actuator and explain its principle of operation with help of necessary governing equation.

15. a). Explain the working principle of RF MEMS in (i) RF communication and (ii) global positioning systems.

(or)

15. b). Explain the principle of operation of a typical micromirror. State how micromirror technology is applied in Scanning Electron Micrograph.