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Total No. of Pages : 1

Total No. of Questions : 08

M.Tech.(EPDT)EL-IV (2016 &amp; Onwards) (Sem.-3)

**SENSOR TECHNOLOGY AND MEMS**

Subject Code : MTET-310

Paper ID : [74800]

Time : 3 Hrs.

Max. Marks : 100

**INSTRUCTION TO CANDIDATES :**

1. Attempt any FIVE questions in all, out of EIGHT questions.
2. Each question carries TWENTY marks.

1.
  - a) Give a classification of sensor types and discuss each category with a suitable example.
  - b) What is a micro-sensor? Write down on evolution of micro-sensors.
2.
  - a) What is a bio-sensor ? What are different types of biosensors? Give constructional details and working of any one type of bio-sensor.
  - b) Discuss the working of any one chemical sensor with the help of suitable diagram.
3.
  - a) What micromachining techniques are used in sensor technology and MEMS ? Explain the process of bulk and surface micromachining.
  - b) Explain buried oxide process used in sensor integrated fabrication technology.
4.
  - a) Discuss the role of etching in fabrication of MEMS. Explain isotropic and orientation dependent wet etching in detail.
  - b) What materials are used in Silicon fusion bonding? Discuss Silicon fusion bonding used in fabrication of MEMS.
5.
  - a) Explain the various steps involved in modeling of electrostatic-elastic system.
  - b) What are some of the issues in using magnetically actuated systems in smart sensor technology?
6. How is a smart sensor different from a conventional sensor? Write down some of the applications of smart sensors.
7.
  - a) Discuss nanolithography and membrane pumps in detail.
  - b) What are nanoelectromechanical systems (NEMS)? Discuss their application in process control industries.
8.
  - a) Explain sacrificial layer technology used in sensor technology and MEMS.
  - b) Discuss any one acoustic sensor with the help of a suitable diagram.