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Total No. of Pages : 02

Total No. of Questions : 08

M.Tech (VLSI D) (2018 Batch) (Sem.-3)
SENSOR TECHNOLOGY AND MEMS
Subject Code : MTVL-PE5A-18
M.Code : 76594

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. Attempt any FIVE questions out of EIGHT questions.
2. Each question carries TWELVE marks.

1.
 - a) Draw the primary and secondary flats for n-type (100), (111) and p-type (100) and (111) silicon wafers.
 - b) What do you mean by chemical vapor deposition? Explain its mechanism of film deposition with one example.
2. Enlist the three key processing steps used in sacrificial layer Technology. Draw the processing steps of typical surface micromachining process.
3.
 - a) Enlist the different electrostatic elastic systems used in MEMS/NEMS. Explain the working of **any three** devices.
 - b) What are different structural materials used for surface micromachining? Enlist their different properties which make them suitable to be used for making different structures.
4.
 - a) Distinguish between isotropic and anisotropic etching in wet etching process . What is the meaning of Directionality in etching?
 - b) What do you mean by stiction? In which micromachining technique it occurs? How to avoid this problem?
5.
 - a) Explain the buried oxide process in detail. Where is it used in MEMS?
 - b) What are the various sensor types? Classify them on the basis of working principle.

6.
 - a) With the help of schematic labeled diagram, explain the working of magnetically actuated micropump.
 - b) Briefly explain the Mass spring Model of a Magnetic Actuation.
7.
 - a) With the help of one example, explain the working principle of MEMS based Biosensors.
 - b) With the help of appropriate schematic diagrams explain the process steps for MEMS fabrication using both types of photoresists.
8.
 - a) What are the different Phenomena which take place in thermal elastic systems? Elaborate briefly.
 - b) Briefly explain the Mass spring Model of a Magnetic Actuation.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.