

Sub - MEMS Technology

Q.P. Code :08592

[Time: 2.30 Hours]

[Marks:80]

N.B:

Please check whether you have got the right question paper.

1. Q.1 is compulsory
2. Attempt any three out of remaining question
3. Assume any suitable data wherever required but justify the same

- Q.1 a) List three silicon compound materials used in MEMS and explain their roles in microsystems. 20
b) What is Annealing?
c) Compare wet and dry etching techniques.
d) Explain principle of digital Mirror device.
- Q.2 a) Discuss selection of material based on application and explain "silicon use as ideal substrate material in MEMS". 10
b) What are the applications of polymers in MEMS and explain methods to make polymers electrical conductive. 10
- Q.3 a) Differentiate between bulk and surface micromachining. Explain the role of sacrificial layer in fabrication of MEMS devices. 10
b) Draw and explain working principle of cantilever. Show basic quantitative behavior of cantilever. Also discuss process steps for fabrication of cantilever. 10
- Q.4 a) State various deposition techniques. Explain in brief the technique of PVD for MEMS device Fabrication. Also define step coverage and shadowing. 10
b) List types of lithography. Explain in detail X-ray lithography with its major features. 10
- Q.5 a) Explain operating principle of pressure sensor. Describe the representation process flow for fabricating pressure sensors. 10
b) Describe in detail inkjet printer head and its fabrication process flow in detail. 10
- Q6 Write short note on:- 20
a) MEMS sensors in internet of things
b) MEMS reliability
c) Wafer bonding and its types
d) TCR & stiffness
