

[Time: 3 Hours]

[Marks:80]

Please check whether you have got the right question paper.

N.B: 1. Q. 1 is compulsory.

2. Attempt any three out of remaining questions.

3. Assume suitable data wherever required and justify the same.

Q.1 Attempt any four.

- What is MEMS? What is significant difference between Microelectronics and Microsystem?
- Discuss the role of SU8 in MEMS applications.
- Define TCR & Stiffness and its significance wrt to MEMS
- What is Etch stop? Discuss it's techniques.
- Describe the phenomenon of Stiction, and possible ways to avoid it.

20**Q.2**

- Discuss the process flow of Photolithography. Explain the types of photoresist used.

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- Explain silicon crystal structure. Why silicon is used as substrate material in MEMS?

10**Q.3**

- Explain in details application of Polymers in MEMS. Why and How to make polymer conductive.

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- What are the design considerations in Selection of MEMS materials?

10**Q.4**

- Describe the process flow for fabricating micro heater. Also explain its working principle.

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- List the types of pressure sensor and show the process steps for fabricating the piezoresistive pressure sensor.

10**Q.5**

- What is MEMS micromachining? Explain in details fabrication process flow of LIGA. Why electroplating is necessary in LIGA process.

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- Compare Deposition techniques used in MEMS with respect to their applications.

10**Q.6** Write Short note on **20**

- Wire bonding
- MEMS Reliability
- Annealing
- Sensors in Biomedical Applications
