

Code No: 157CJ**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech IV Year I Semester Examinations, February/March - 2022****MEMS****(Mechanical Engineering)****Time: 3 Hours****Max. Marks: 75****Answer any Five Questions
All Questions Carry Equal Marks**

- 1.a) Highlights the features of Microelectronics with regards to MEMS.
- b) List and explain the benefits of miniaturization. [8+7]
- 2.a) Compare and contrast different etching methods.
- b) What does the photolithography process do? Explain briefly. [8+7]
- 3.a) Describe the role of sacrificial layers in surface micromachining.
- b) Analyze and present the merits and demerits of Surface micromachining. [8+7]
- 4.a) What is the principal difference between bulk and surface micromachining?
- b) What is DRIE process? How can DRIE achieve virtually perfect vertical etching? [8+7]
5. Explain the properties of MEMS materials are concerned- name them. Define all the property parameters you know. [15]
- 6.a) Draw stress - strain diagrams for mild steel and brittle materials of MEMS.
- b) Define bending moment. Explain flexural beam bending analysis under simple loading condition. [8+7]
- 7.a) Discuss the principle of operation typical MEMS switch used for RF applications.
- b) What are the principal applications of microsensors and actuators? [7+8]
8. Explain the design, functioning and applications of micro-fluidic system. [15]

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