

Total No. of Questions : 8]

SEAT No. :

P3613

[Total No. of Pages : 2

[4959]-1099

B.E. (E & TC)

Nano Electronics and MEMS

(2012 Pattern) (Semester - II)

Time : 2½ Hours]

[Max. Marks : 70

*Instructions to the candidates:*

- 1) Answer any one question out of Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Use of electronic pocket calculator is allowed.
- 4) Assume suitable data, if necessary.

- Q1)** a) Explain temperature effects in semiconductor. [7]
- b) What is Lithography? Write different methods which are used for IC fabrication. [7]
- c) What is Fin FET? How it is different than normal FET? [6]

OR

- Q2)** a) What are the different technologies which are used for silicon crystal growth? [7]
- b) What is etching? What do you mean by wet etching and dry etching? [7]
- c) Write short notes on : [6]
- i) Dopant diffusion
  - ii) Sputtering

- Q3)** a) Discuss three different approaches for circuits that can be integrated with MEMS. [9]
- b) What is Encapsulation? Explain Importance of it. [9]

OR

- Q4)** a) Explain experimental methods for measuring intrinsic stress. [9]
- b) Write a short note on [9]
- i) Sensor
  - ii) Actuator
  - iii) Transducer

**P.T.O.**

- Q5)** a) What is direct and inverse effect of piezo electric sensors? [8]  
b) Compare electrostatic and thermal actuation methods. [8]

OR

- Q6)** a) What are the aspects, which should be considered for successful design of accelerometer. [8]  
b) Write short note on comb drive devices. [8]

- Q7)** a) Write short note on [8]  
i) Profilo meter  
ii) Reflectometer  
b) What are the advantages and disadvantages of Transmission Electron Microscopy (TEM) in comparison to Scanning Electron Microscopy (SEM). [8]

OR

- Q8)** a) What is FTIR? Explain advantages, limitations and applications FTIR. [8]  
b) Write short note on Atomic Force Microscope. (AFM) [8]

