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Total Pages : 3

322103

December, 2019

M.Tech. (VLSI) 1st SEMESTER

VLSI Technology with MEMS Applications (MVLE106)

Time : 3 Hours] [Max. Marks : 75

Instructions :

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
2. *Answer any four questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

PART - A

1. (a) Give the advantages and applications of SOI structures. *(1.5)*

(b) Why rate of growth in wet oxidation is more compared with the dry oxidation? *(1.5)*

(c) Compare diffusion and ion implantation process. *(1.5)*

(d) What is isotropic and anisotropic etching? Discuss. *(1.5)*

(e) What is the role of plasma in etching? Discuss. (1.5)

(f) What is SUPREM and its use in VLSI fabrication? (1.5)

(g) What are MEMS? Give some applications of MEMS. (1.5)

(h) What is SQUID magnetometer? Discuss. (1.5)

(i) What is wafer bonding? Discuss. (1.5)

(j) What are negative and positive photo resists? (1.5)

PART - B

2. (a) Explain the basic transport processes and reaction kinetics in vapors phase epitaxy. (7.5)

(b) Explain the process of single crystal formation with help of CZ process. (7.5)

3. (a) Discuss and explain the silicon oxidation model. (7.5)

(b) Explain the process of molecular beam epitaxy with relevant diagram. (7.5)

4. (a) Describe the different printing techniques used in photolithography process. (7.5)

(b) What is electron beam lithography process? Explain. Discuss its advantages over optical lithography. (7.5)

5. (a) Discuss the role of etching process in VLSI fabrication. Explain the process of reactive ion etching. (7.5)

(b) Discuss reliability issues in the VLSI technology. (7.5)

6. (a) What is Bulk and Surface Micromachining? Compare these techniques. (7.5)

(b) Write short note on finite element method. (7.5)

7. (a) What are optical sensors? Discuss operation and give their application. (7.5)

(b) Write a short note on MEMS accelerometer. (7.5)