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VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.



Question Paper Code: 7030

M.E. / M.Tech. DEGREE END-SEMESTER EXAMINATIONS – DECEMBER 2019

First Semester

VLSI Design

P19VDE13– INTRODUCTION TO MEMS

(Regulation 2019)

Time : Three Hours

Maximum : 100 Marks

Answer ALL the questions

PART – A

(10 x 2 = 20 Marks)

1. Define MEMS. What are the benefits of designing MEMS devices?
2. List any 2 major events in the history of MEMS.
3. Differentiate between Integrated & Intelligent sensors.
4. Give any 2 reasons, why Silicon is the most widely used substrate material for MEMS.
5. What are actuators? Why they are needed in any system?
6. What is a micro pump?
7. List 2 applications of MEMS in Mechanical field.
8. Why we use oxide layer in Surface Micromachining?
9. How optical MEMS are different from Mechanical MEMS?
10. List any 2 applications of optical MEMS.

PART – B

(5 x 13 = 65 Marks)

11. a) Describe about Bulk Micromachining technique.
(OR)
b) Explain the principle and working of silicon pressure sensors.

12. a) Differentiate between Isotropic Etching and Anisotropic Etching.
(OR)
b) Explain the working principle, material and application of any one Electrical Sensor of your choice.
13. a) What is the difference between Electromagnetic and Thermal micro actuation? Explain in detail.
(OR)
b) i. What do you understand by Surface Micromachining? (6)
ii. What are the requirements for surface micromachining? (7)
14. a) Explain the working of any 3-D electromagnetic actuators.
(OR)
b) List and describe any 2 success stories of MECHANICAL MEMS.
15. a) What are the differences & similarities between electronics and photonics devices? List and explain applications, where both devices can complement each other.
(OR)
b) Explain the working and application of any one Photonic device of your choice.

PART – C

(1 x 15 = 15 Marks)

16. a) Describe in detail about the different applications of MEMS actuators.
(OR)
b) Explain the synthesis, working and application of DNA chip.
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