

Question Paper



MANIPAL UNIVERSITY

SCHOOL OF INFORMATION SCIENCES
FIRST SEMESTER MASTER OF ENGINEERING - ME (VLSI DESIGN)
DEGREE EXAMINATION - NOVEMBER 2017
DATE : Monday, November 20, 2017
TIME : 10:00AM - 1:00PM
Digital Systems and VLSI Design [EDA 613]

Marks: 100

Duration: 180 mins.

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Answer all the questions.

- 1) With relevant sketches explain the different stages of manufacturing. (10)
- 2) Explain the possible crystal defects and their effects after the crystal is grown. (10)
- 3) Explain various surface preparation steps in patterning process. (10)
- 4) Explain the concept of diffusion. Write a note on dopant sources. (10)
- 5) What are the important second order effects in MOSFETs? Explain them briefly. (10)
- 6) Explain the operation of a CMOS inverter, showing different regions of operation. (10)
- 7) Derive an expression for the short-circuit power dissipation component in a CMOS circuit. Devise a method to reduce this component by analyzing each element in this expression. (10)
- 8) Give the detailed design of a CMOS D flip-flop. Using this how do you design a 4-bit asynchronous binary counter? Explain. (10)
- 9) Design a CMOS single bit full adder. Using this adder, explain how do you construct a magnitude comparator circuit? (10)
- 10) What are the 3 types of switch-level RC delay models developed to estimate the delays of logic gates? Explain briefly with an example. (10)

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