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Paper Code : OE-601C/OE-EE601C VLSI And Micro Electronics

UPID : 006748

Time Allotted : 3 Hours

Full Marks : 70

The Figures in the margin indicate full marks.

Candidate are required to give their answers in their own words as far as practicable

Group-A (Very Short Answer Type Question)

1. Answer *any ten* of the following :

[1 x 10 = 10]

- (I) What are the advantages of CMOS inverter over other inverters?
- (II) Why Si is preferred over Ge in VLSI?
- (III) In VHDL, where are the components declared?
- (IV) What do you mean by GLSI?
- (V) Why polysilicon is used for gate in CMOS technology?
- (VI) What is positive photoresist?
- (VII) Which logical operator does not follow associative properties?
- (VIII) What do you mean by SoC?
- (IX) Which type of logic is supported by STD_LOGIC?
- (X) What is dry oxidation?
- (XI) Write down the name of two techniques used for metallization process.
- (XII) Why NMOS technology is preferred more than PMOS technology?

Group-B (Short Answer Type Question)

Answer *any three* of the following :

[5 x 3 = 15]

2. Differentiate between CPLD and FPGA. [5]
3. What do you mean by MOSFET scaling? What are the different types of scaling techniques? [5]
4. Describe the twin tub process in CMOS technology. [5]
5. What do you mean by the sequential and concurrent statements? Give examples for each. [5]
6. Describe the n-well fabrication process with a suitable diagram. [5]

Group-C (Long Answer Type Question)

Answer *any three* of the following :

[15 x 3 = 45]

7. (a) Describe the purpose of the following: [6]
 - (i) entity declaration
 - (ii) architecture body
- (b) What is the full form of VHDL? [2]
- (c) Write down the VHDL code for half-adder circuit. [7]
8. (a) Make a comparative study among ROM, PAL and PLA based system design. [6]
- (b) Draw the Y chart and explain the VLSI design process. [5]
- (c) What do you mean by hierarchical abstraction? [4]
9. (a) Explain the operation of CMOS inverter with a proper circuit diagram. [5]
- (b) Draw the CMOS inverter characteristic curve and explain the various regions in the curve. [6]
- (c) What do you mean by noise margin? Indicate the same on the CMOS inverter characteristics curve. [4]
10. (a) What is meant by etching? [2]
- (b) What are the different types of etching? [3]
- (c) Discuss the plasma etching process in detail. [6]
- (d) Make a comparative study between dry etching and wet etching. [4]
11. Design the stick diagram of the following Boolean function: [15]

$$Z = (A(D+E) + BC)'$$