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12EC027

M.Tech. Degree Examination, Dec.2013/Jan.2014

Design of VLSI Systems

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions.

- 1 a. Explain the terms modularity and locality with one example for each. (10 Marks)
 b. Explain : i) Full-custom mask design. (10 Marks)
 ii) Standard cell design.
- 2 a. Explain logic optimization with a typical flow diagram. (10 Marks)
 b. Explain the following design capture tools with tool names: (10 Marks)
 i) HDL design ii) Schematic design iii) Layout design
- 3 a. With necessary diagrams, explain the simple Manchester adder with carry bypass. (10 Marks)
 b. Draw the table for radix-4 modified booth encoding values and design booth encoder and booth selector for this. (10 Marks)
- 4 a. State some commonly used shifters. Explain array funnel shifter with a neat diagram. (10 Marks)
 b. Explain bit-serial and bit-parallel adders. (10 Marks)
- 5 a. Explain FSM design procedure with an example. (10 Marks)
 b. Explain PLA control implementation with an example. (10 Marks)
- 6 a. Explain the properties of I/O subsystems, and explain the basic I/O pad circuits. (10 Marks)
 b. Explain : i) NRE costs ii) Fixed costs. (10 Marks)
- 7 a. Explain IEEE 1149 boundary scan architecture in detail. (10 Marks)
 b. Explain the terms controllability, observability and fault coverage. Explain 2 different fault models. (10 Marks)
- 8 Write short notes on: (20 Marks)
 - a. Ad-hoc testing.
 - b. Design of RISC microcontroller.
 - c. Power distribution employed while designing special purpose subsystems.
 - d. Content addressable memory (CAM).

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.

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