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1.6.13 FN

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Question Paper Code : 21430

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2013.

Sixth Semester

Electronics and Instrumentation Engineering

EI 2353 / EI 63 / 10133 EI 603 – DIGITAL SYSTEM DESIGN

(Regulation 2008 / 2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Which logic family performs better in a high-noise environment: CMOS or TTL? Why?
2. What is the main advantage of ECL over other IC technologies? In what type of application should ECL not be considered?
3. List two advantages of programmable logic over fixed function logic.
4. What does CPLD stand for? How is it different from the term PLD?
5. Mention two differences between PLD and ROM.
6. What would be the structure of the binary address for a memory system having a capacity of 512 bits?
7. Draw the block diagram of a basic frequency counter.
8. An ADC3511 is connected with a reference voltage of +2 V dc. What will be the count held in the counter for an analog input of 1.25 V dc?
9. Define the term controllability and observability with respect to design for testing of logic circuits.
10. When do we go for scan methods based testing?

PART B — (5 × 16 = 80 marks)

11. (a) Draw the circuit diagram of two input TTL NOR gate and explain its operation. Also explain TTL-TO-CMOS interface.

Or

- (b) Draw the circuit of CMOS inverter and explain its operation. Also explain the precautionary steps that one has to observe in handling CMOS devices.
12. (a) How does a PLA differ from PAL? Implement the following functions using Read Only Memory (ROM)

$$W(A,B,C,D)=\sum m(3,7,8,9,11,15)$$

$$X(A,B,C,D)=\sum m(3,4,5,7,10,14,15)$$

$$Y(A,B,C,D)=\sum m(1,5,7,11,15).$$

Or

- (b) Realize the Sum of product expression $Y= \sum m(0,5,10,15)$ using 4:1 multiplexers.
13. (a) Draw a basic logic diagram for a 256 X 8 bit static RAM, showing all the inputs and outputs. Also, mention the capacity of a DRAM that has twelve address lines.

Or

- (b) Give two valid differences between SRAM and DRAM. Use 16k X 8 DRAM to built 64 k V X 8 DRAM, show the logic diagram.
14. (a) With a neat functional diagram explain four decimal digit multiplexed display.

Or

- (b) Explain in detail the design of digital voltmeter. Mention few factors that decide the resolution of the digital voltmeter.
15. (a) Discuss in detail about digital circuit testing by applying test vectors and by in-circuit testing.

Or

- (b) Explain the concept of
- (i) Full Serial Integrated Scan and
- (ii) Isolated Serial Scan.