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A.1.16 AN

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Question Paper Code : 21537

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2015.

Sixth Semester

Electronics and Instrumentation Engineering

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

(Regulations 2008/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Name two radical differences between ECL output and CMOS output.
2. When is a pull-up resistor required in interfacing TTL and CMOS?
3. List two major differences between PAL and PEA.
4. What does PAL10L8 specify?
5. Why a ROM is considered nonvolatile memory?
6. What does it mean to say that a chip is mask programmable?
7. Mention two advantages of multiplexing displays.
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 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 NAND gate and explain its operation. Mention different types of CMOS logic family ICs.

12. (a) Implement the following functions using Read Only Memory (ROM)

$$W(A, B, C, D) = \Sigma m(2, 7, 8, 9, 11, 15)$$

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

$$Y(A, B, C, D) = \Sigma m(1, 5, 7, 9, 15).$$

Or

- (b) Realize the Sum of Product expression $Y = \Sigma m(0, 4, 8, 12)$ using 4:1 multiplexers. Why multiplexers are considered as universal logic circuit?
13. (a) Draw a basic logic diagram for a 256 × 8 bit static RAM. showing all the inputs and outputs. It is desired to combine several 2k × 8 PROMS to produce a total capacity of 8k × 8. How many PROM chips are needed? How many address bus lines are required?

Or

- (b) Give two valid differences between SRAM and DRAM. Use 6k × 8 DRAM to built 64k × 8 DRAM, show the logic diagram.
14. (a) With a neat functional diagram explain four decimal digit multiplexed display.

Or

- (b) With a neat functional diagram, explain the operation of frequency counter.
15. (a) Explain any two adhoc design for testing techniques in detail.

Or

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