Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐☐

M 2468

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2008.

Fifth Semester

Electrical and Electronics Engineering

EE 333 — DIGITAL SYSTEMS

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.   Convert octal 75 to decimal number.

2.   What is the need for Gray code?

3.   State De-Morgan's laws.

4.   Use Boolean Algebra to simplify the equation :

$y = A\overline{B}C + ABC + \overline{C}$.

5.   List some applications of multiplexers.

6.   Draw the block diagram of Half adder and give its truth table.

7.   Draw the block diagram of SR flip flop and give its truth table.

8.   Draw the block diagram of memory unit.

9.   Why parallel counter is faster than ripple counter?

10. What is the difference between Mealy and Moore model?

PART B — (5 × 16 = 80 marks)

11. (a) Write short notes on the following :

    (i) Alphanumeric codes. (6)

    (ii) Parity code. (5)

    (iii) Excess 3 code. (5)

Or

(b) (i) Perform the arithmetic operations $(+50)+(-10)$ and $(-50)-(-10)$ using the signed 2's complement representation for negative numbers. (6)

    (ii) Represent decimal number 1010 in BCD, Excess 3 code and as binary number. (6)

    (iii) Convert decimal number 1234.75 to octal and hexadecimal. (4)

12. (a) State and prove Basic Laws of Boolean Algebra.

Or

(b) Simplify the following expression using K-map and implement the same only using NAND gates :

$F(A, B, C, D) = \Sigma(0, 1, 2, 4, 5, 7, 11, 15)$

13. (a) (i) Explain in detail about magnitude comparator. (8)

    (ii) What is decoder? With necessary diagrams explain the operation of 4 to 16 line decoder. (8)

Or

(b) Explain the operation of 8 × 1 multiplexer and implement the following function with the same :

$F(A, B, C, D) = \Sigma(0, 1, 3, 4, 8, 9, 15)$.

14. (a) (i) Explain the operation of MOD8 up counter. (8)

(ii) Design a synchronous counter using JK flip flop for the given sequence : (8)

(6)

(5)

0, 1, 3, 5, 7, 6, 4, 2.

Or

(5)

(b) Discuss the analyses of asynchronous sequential circuit with suitable example. (16)

15. (a) Explain the steps involved in system design using PLA with an example. (16)

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(b) Design a BCD counter using JK flip flop. (16)

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