

B.E. DEGREE EXAMINATIONS: NOV/DEC 2010

Third Semester

COMPUTER SCIENCE AND ENGINEERING

U07CS305: Digital Principles and System Design

Time: Three Hours

Maximum Marks: 100

Answer All Questions:-

PART A (10 x 1 = 10 Marks)

1. Convert $(634)_8$ to binary
a) 110011100 b) 111001100 c) 110010011 d) 100000111
2. Bubbled OR gate is equal to -----.
a) NAND b) NOR c) Exclusive OR d) AND
3. Fan-out is -----.
a) The number of standard loads that can be connected to the output of the gate.
b) amount current available in the output of the gate.
c) amount of current available in the input of the gate.
d) all of the above.
4. When a CMOS logic circuit is in a static state , its power dissipation is -----?
a) very high b) very low c) normal d) high
5. Binary equivalent of gray code 101011 is
a) 111011 b) 110010 c) 000111 d) 111111
6. Abbreviations of EBCDIC code is
a) Extensible Bit Coded Decimal Information Code
b) Extended Binary Coded Decimal Information Code
c) Excess Binary Coded decimal Information Code
d) Extended Byte Coded Decimal Informational Code.
7. Demultiplexer is
a) Data selector b) Data Distributor c) Both a and b d) Data receiver
8. Characteristic equation of a JK flipflop is
a) $Q(t+1) = JQ + K'Q$ b) $Q(t+1) = JQ$ c) $Q(t+1) = JQ' + K'Q$ d) $Q(t+1) = JQ' + J'Q$
9. A ripple counter is a ----- sequential counter
a) Synchronous b) Asynchronous c) Modulo d) both b and c

10. Volatile memory

- a) ROM b) SRAM c) DRAM d) both b and c

PART B (10 x 2 = 20 Marks)

11. Given the two binary numbers $X = 1010100$ and $Y = 1000011$, perform the Subtraction (a) $X - Y$ and (b) $Y - X$ using 1's complements.
12. What is the algebraic function of Exclusive-OR gate and Exclusive-NOR gate?
13. What is propagation delay?
14. What is code converter?
15. What is sequential circuit?
16. What are the uses of a counter?
17. What is a state equation?
18. What is bi-directional shift register and unidirectional shift register?
19. What is programmable logic array? How it differs from ROM?
20. What is field programmable logic array?

PART C (5 x 14 = 70 Marks)

21. a) Simplify the Boolean function and implement using logic gates.

$$F(A, B, C, D) = \sum(1, 3, 5, 7, 9, 15)$$

$$D(A, B, C, D) = \sum(4, 6, 12, 13)$$

(OR)

b) Simplify the following Boolean function using k map and implement it with NAND gate
 $F(A, B, C, D) = \sum(0, 1, 2, 3, 4, 8, 9, 12)$. Find complement of the function and implement with NOR gate.

22. a) Discuss all characteristics of digital ICs.

(OR)

b) Explain in detail about schottky TTL.

23. a) Draw the circuit for 3-to-8-decoder and implement the functions

$$F1(A, B, C) = \Pi(0, 1, 3, 7)$$

$$F2(A, B, C) = \Pi(2, 3, 7) \text{ using 3-to-8-decoder}$$

(OR)

b) Draw the circuits for Decimal to BCD encoder, Octal-to-Binary encoder & Priority encoder and explain.

24. a) Design a sequential detector which produces an output 1 every time the input sequence.

(OR)

b) Explain the working of BCD Ripple Counter with the help of state diagram and logic diagram.

25. a) Explain in detail about PLA and PAL.

(OR)

b) Explain with neat diagrams a ROM architecture.
