

Code No: 07A3EC16

R07**Set No. 2**

II B.Tech I Semester Examinations, November 2010

DIGITAL LOGIC DESIGNCommon to Information Technology, Computer Science And Engineering,
Computer Science And Systems Engineering

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Design a circuit with four inputs and one output where the output is 1 if the input is divisible by 3 or 7.
 - (b) A safe has 5 locks: v, w, x, y, all of which must be unlocked for the safe to open. The keys to the locks are distributed among five executives in the following manner:
 - Mr.A has keys for locks v & x
 - Mr.B has keys for locks v & y
 - Mr.C has keys for locks w & y
 - Mr.D has keys for locks x & z
 - Mr.E has keys for locks v & z
 - i. Determine the minimal no. of executives required to open the safe.
 - ii. Find all the combinations of executives that can open the safe, write an expression $f(A, B, C, D, E)$ which specifies when the safe can be opened as a function of which executives are present
 - iii. Who is the 'essential executive' without whom the safe cannot be opened.
- [7+9]
2. Convert the following numbers:
 - (a) 10101100111.0101 to Base 10
 - (b) $(153.513)_{10} = ()_8$
 - (c) Find $(3250 - 72532)_{10}$ using 10's complement
 - (d) Divide 01100100 by 00011001
 - (e) Given that $(292)_{10} = (1204)_b$ determine 'b'

[3+4+3+3+3]
 3. (a) Design a circuit with three inputs (A, B, C) and two outputs (X, Y) where the outputs are the binary count of the number of "ON" (HIGH) inputs
 - (b) Design a circuit with four inputs and one output where the output is 1 if the input is divisible by 3 or 7.
- [8+8]
4. Explain about HDL for Sequential Circuits in Detail? [16]
 5. (a) Draw and Explain the Gated-Latch Logic diagram
 - (b) Explain about the types of hazards in detail? [8+8]

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6. A DRAM chip uses two-dimensional address multiplexing. It has 13 common Address pins with the row Address having 1 bit longer than the column address. What is the capacity of the memory? [16]
7. For the function $T(w,x,y,z) = \sum(0,1,2,3,4,6,7,8,9,11,15)$:
- (a) Find all prime implicants and indicate which are essential through the Kmap
 - (b) Design a circuit which will find the 2's complement of a 4 bit binary number. Use one full adder, 3 half adders and any additional gates. [6+10]
8. Explain about 4-bit binary Ripple Counters? [16]

FIRSTRANKER

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R07**Set No. 4**

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 - (e) Given that $(292)_{10} = (1204)_b$ determine 'b' [3+4+3+3+3]
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 - (a) Design a circuit with three inputs(A,B,C) and two outputs(X,Y) where the outputs are the binary count of the number of "ON" (HIGH) inputs
 - (b) Design a circuit with four inputs and one output where the output is 1 if the input is divisible by 3 or 7. [8+8]
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 - (a) Draw and Explain the Gated-Latch Logic diagram
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 - (a) Design a circuit with four inputs and one output where the output is 1 if the input is divisible by 3 or 7.
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 - Mr.D has keys for locks x& z
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 - i. Determine the minimal no. of executives required to open the safe.
 - ii. Find all the combinations of executives that can open the safe, write an expression $f(A,B,C,D,E)$ which specifies when the safe can be opened as a function of which executives are present
 - iii. Who is the 'essential executive' without whom the safe cannot be opened. [7+9]

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R07**Set No. 4**

6. A DRAM chip uses two-dimensional address multiplexing. It has 13 common Address pins with the row Address having 1 bit longer than the column address. What is the capacity of the memory? [16]
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8. Explain about 4-bit binary Ripple Counters? [16]

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R07**Set No. 1**

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 - (e) Given that $(292)_{10} = (1204)_b$ determine 'b' [3+4+3+3+3]
4. Explain about 4-bit binary Ripple Counters? [16]
5. (a) Design a circuit with three inputs (A, B, C) and two outputs (X, Y) where the outputs are the binary count of the number of "ON" (HIGH) inputs
- (b) Design a circuit with four inputs and one output where the output is 1 if the input is divisible by 3 or 7. [8+8]

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R07**Set No. 1**

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(b) $(153.513)_{10} = ()_8$ (c) Find $(3250 - 72532)_{10}$ using 10's complement

(d) Divide 01100100 by 00011001

(e) Given that $(292)_{10} = (1204)_b$ determine 'b' [3+4+3+3+3]

2. (a) Draw and Explain the Gated-Latch Logic diagram

(b) Explain about the types of hazards in detail? [8+8]

3. Explain about HDL for Sequential Circuits in Detail? [16]

4. (a) Design a circuit with three inputs(A,B,C) and two outputs(X,Y) where the outputs are the binary count of the number of "ON" (HIGH) inputs

(b) Design a circuit with four inputs and one output where the output is 1 if the input is divisible by 3 or 7. [8+8]

5. Explain about 4-bit binary Ripple Counters? [16]

6. (a) Design a circuit with four inputs and one output where the output is 1 if the input is divisible by 3 or 7.

(b) A safe has 5 locks: v, w, x, y, all of which must be unlocked for the safe to open. The keys to the locks are distributed among five executives in the following manner:
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