Code No: 07A3EC16 **R07** **Set No. 2**

**II B.Tech I Semester Examinations,May 2011**
**DIGITAL LOGIC DESIGN**
**Common 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**

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1. Explain about the two ways to achieve a BCD Counter using a Counter with Parallel Load? [16]

2. (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]

3. Explain about the following:

   (a) Merger diagrams

   (b) Flow and implication tables. [16]

4. (a) Implement Half adder using 4 NAND gates.

   (b) Implement full subtractor using NAND gates only. [6+10]

5. (a) design a 2 bit comparator using gates.

   (b) Use an 8-to-1 MUX to design the following combinational logic circuit There are four adjacent parking slots in the XYZ Inc executive parking area. Each slot is equipped with a special sensor whose output is asserted high when a car is occupying the slot. Design a decoding system that will signal the existence of two or more adjacent vacant slots. [10+6]

6. Tabulate the truth table for an 8 X 4 ROM that implements the Boolean functions
   A(x,y,z)= $\sum$(1,2,4,6)
   B(x,y,z)= $\sum$(0,1,6,7)
   C(x,y,z) = $\sum$(2,6)
   D(x,y,z) = $\sum$(1,2,3,5,7)
   Considering now the ROM as a memory, specify the memory contents at addresses 1 and 4? [16]

7. (a) What is the gray code equivalent of the Hex Number 3A7
   (b) Find the biquinary of number code for the decimal numbers from 0 to 9
   (c) Find 9's complement $(25.639)_{10}$
   (d) Find (72532 03250) using 9's complement. [4+4+4+4]

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

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Code No: 07A3EC16 **R07** **Set No. 4**

**II B.Tech I Semester Examinations,May 2011**
**DIGITAL LOGIC DESIGN**
**Common 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**

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1. Explain about HDL for Sequential Circuits in Detail? [16]
2. (a) Implement Half adder using 4 NAND gates.
   (b) Implement full subtractor using NAND gates only. [6+10]
3. Explain about the two ways to achieve a BCD Counter using a Counter with Parallel Load? [16]
4. (a) What is the gray code equivalent of the Hex Number 3A7
   (b) Find the biquinary of number code for the decimal numbers from 0 to 9
   (c) Find 9's complement $(25.639)_{10}$
   (d) Find (72532 03250) using 9's complement. [4+4+4+4]
5. Explain about the following:
   (a) Merger diagrams
   (b) Flow and implication tables. [16]
6. (a) design a 2 bit comparator using gates.
   (b) Use an 8-to-1 MUX to design the following combinational logic circuit There are four adjacent parking slots in the XYZ Inc executive parking area. Each slot is equipped with a special sensor whose output is asserted high when a car is occupying the slot. Design a decoding system that will signal the existence of two or more adjacent vacant slots. [10+6]
7. Tabulate the truth table for an 8 X 4 ROM that implements the Boolean functions
   $A(x,y,z) = \sum(1,2,4,6)$
   $B(x,y,z) = \sum(0,1,6,7)$
   $C(x,y,z) = \sum(2,6)$
   $D(x,y,z) = \sum(1,2,3,5,7)$
   Considering now the ROM as a memory, specify the memory contents at addresses 1 and 4? [16]
8. (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]

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Code No: 07A3EC16 **R07** **Set No. 1**

**II B.Tech I Semester Examinations,May 2011**
**DIGITAL LOGIC DESIGN**
**Common 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**

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1. Explain about the following:
   (a) Merger diagrams
   (b) Flow and implication tables. [16]

2. Tabulate the truth table for an 8 X 4 ROM that implements the Boolean functions
   A(x,y,z)= $\sum$(1,2,4,6)
   B(x,y,z)= $\sum$(0,1,6,7)
   C(x,y,z) = $\sum$(2,6)
   D(x,y,z) = $\sum$(1,2,3,5,7)
   Considering now the ROM as a memory, specify the memory contents at addresses 1 and 4? [16]

3. (a) Implement Half adder using 4 NAND gates.
   (b) Implement full subtractor using NAND gates only. [6+10]

4. (a) design a 2 bit comparator using gates.
   (b) Use an 8-to-1 MUX to design the following combinational logic circuit There are four adjacent parking slots in the XYZ Inc executive parking area. Each slot is equipped with a special sensor whose output is asserted high when a car is occupying the slot. Design a decoding system that will signal the existence of two or more adjacent vacant slots. [10+6]

5. (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
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   Mr.D has keys for locks x& z
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8. Explain about HDL for Sequential Circuits in Detail? [16]

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Code No: 07A3EC16 **R07** **Set No. 3**

**II B.Tech I Semester Examinations,May 2011**
**DIGITAL LOGIC DESIGN**
**Common 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**

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1. (a) What is the gray code equivalent of the Hex Number 3A7
   (b) Find the biquinary of number code for the decimal numbers from 0 to 9
   (c) Find 9's complement $(25.639)_{10}$
   (d) Find (72532 03250) using 9's complement. [4+4+4+4]

2. Explain about the two ways to achieve a BCD Counter using a Counter with Parallel Load? [16]

3. Tabulate the truth table for an 8 X 4 ROM that implements the Boolean functions
   A(x,y,z)= $\sum$(1,2,4,6)
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   Considering now the ROM as a memory, specify the memory contents at addresses 1 and 4? [16]

4. (a) Implement Half adder using 4 NAND gates.
   (b) Implement full subtractor using NAND gates only. [6+10]

5. (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]

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