Code No: 07A4EC09 **R07** **Set No. 2**

II B.Tech II Semester Examinations,April/May 2012
SWITCHING THEORY AND LOGIC DESIGN
Common to Electronics And Telematics, Electronics And Communication Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Draw an ASM chart for the state table given below. Design a control unit with the help of D-Flip flop and decoders. [16]

PS	NS	
	X = 0	X = 1
000	011,0	100,1
001	001,0	100,1
010	010,0	000,1
011	001,0	010,1
100	010,0	011,0

2. (a) Draw the block diagram of a ROM. Define address and word. Relate the number of output lines with number of bits in a word. How an output word can be selected?
   (b) For a 64×8 ROM, determine the number of words it contains and the size of eah word. How many output lines are there for the ROM? [8+8]

3. (a) Give a brief description about the following number systems with suitable examples.
      i. Decimal number system
      ii. Binary number system
      iii. Octal number system
      iv. Hexadecimal system
   (b) i. Convert $(2598.675)_{10}$ to hexadecimal
      ii. Convert $(10010.1011)_2$ to decimal
      iii. Convert $(10111101.01101001)_2$ to octal
      iv. Convert $(465.0647)_8$ to Binary. [8+8]

4. Implement the following functions using appropriate DECODER
   F1 = Σm(2,4,6,8,12)
   F2 = Σm(1,3,6,7,9,10)
   F3 = Σm(1,3,4,5,6,9,12,14)
   F4 = Σm(2,4,8) [16]

5. Determine the logic function produced by A and B when applied to A water pump is required to turn ON automatically whenever the water level in any two or more of three tanks A, B and C falls below a pre-set level. Each water tank is provided

with a level detector that generates a HIGH voltage whenever the water level in that tank is LOW. Derive a Switching function with minimum number of literals to implement the above situation. [16]

6. (a) Differentiate edge triggering, Level triggering and Pulse triggering.
   (b) Design a clocked JK flip flop. Explain its operation with the help of characteristic table and characteristic equation. Give the symbol of edge triggered JK flipflop. [8+8]

7. (a) Express the Boolean function:
   F(x,y,z) = xy +x′z in a product of maxterm form
   (b) How many rows will be there in the truth table of a logic system having n input binary variable?
   (c) Prepare the truth table for the Boolean function
   F(X, Y , Z) = X(YZ′ + Y′Z) [8+2+6]

8. Determine a minimal state table equivalent to the state table given below. [16]

PS	NS,Z	
	J1	J2
I1	I4,0	I2,1
I2	I7,0	I1,0
I3	I4,0	I2,1
I4	I3,0	I2,1
I5	I4,0	I1,1
I6	I5,1	I6,1
I7	I5,1	I6,1

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Code No: 07A4EC09 **R07** **Set No. 4**

II B.Tech II Semester Examinations,April/May 2012
SWITCHING THEORY AND LOGIC DESIGN
Common to Electronics And Telematics, Electronics And Communication Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Give a brief description about the following number systems with suitable examples.
   i. Decimal number system
   ii. Binary number system
   iii. Octal number system
   iv. Hexadecimal system
   (b) i. Convert $(2598.675)_{10}$ to hexadecimal
   ii. Convert $(10010.1011)_2$ to decimal
   iii. Convert $(10111101.01101001)_2$ to octal
   iv. Convert $(465.0647)_8$ to Binary. [8+8]

2. Implement the following functions using appropriate DECODER
   F1 = Σm(2,4,6,8,12)
   F2 = Σm(1,3,6,7,9,10)
   F3 = Σm(1,3,4,5,6,9,12,14)
   F4 = Σm(2,4,8) [16]

3. (a) Draw the block diagram of a ROM. Define address and word. Relate the number of output lines with number of bits in a word. How an output word can be selected?
   (b) For a 64×8 ROM, determine the number of words it contains and the size of eah word. How many output lines are there for the ROM? [8+8]

4. (a) Differentiate edge triggering, Level triggering and Pulse triggering.
   (b) Design a clocked JK flip flop. Explain its operation with the help of characteristic table and characteristic equation. Give the symbol of edge triggered JK flipflop. [8+8]

5. Draw an ASM chart for the state table given below. Design a control unit with the help of D-Flip flop and decoders. [16]

PS	NS	
	X = 0	X = 1
000	011,0	100,1
001	001,0	100,1
010	010,0	000,1
011	001,0	010,1
100	010,0	011,0

6. Determine the logic function produced by A and B when applied to A water pump is required to turn ON automatically whenever the water level in any two or more of three tanks A, B and C falls below a pre-set level. Each water tank is provided with a level detector that generates a HIGH voltage whenever the water level in that tank is LOW. Derive a Switching function with minimum number of literals to implement the above situation. [16]

7. Determine a minimal state table equivalent to the state table given below. [16]

PS	NS,Z	
	J1	J2
I1	I4,0	I2,1
I2	I7,0	I1,0
I3	I4,0	I2,1
I4	I3,0	I2,1
I5	I4,0	I1,1
I6	I5,1	I6,1
I7	I5,1	I6,1

8. (a) Express the Boolean function:
   F(x,y,z) = xy +x′z in a product of maxterm form
   (b) How many rows will be there in the truth table of a logic system having n input binary variable?
   (c) Prepare the truth table for the Boolean function
   F(X, Y , Z) = X(YZ′ + Y′Z) [8+2+6]

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Code No: 07A4EC09 **R07** **Set No. 1**

II B.Tech II Semester Examinations,April/May 2012
SWITCHING THEORY AND LOGIC DESIGN
Common to Electronics And Telematics, Electronics And Communication Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Draw the block diagram of a ROM. Define address and word. Relate the number of output lines with number of bits in a word. How an output word can be selected?
   (b) For a 64×8 ROM, determine the number of words it contains and the size of eah word. How many output lines are there for the ROM? [8+8]

2. (a) Express the Boolean function:
   F(x,y,z) = xy +x′z in a product of maxterm form
   (b) How many rows will be there in the truth table of a logic system having n input binary variable?
   (c) Prepare the truth table for the Boolean function
   F(X, Y , Z) = X(YZ′ + Y′Z) [8+2+6]

3. Draw an ASM chart for the state table given below. Design a control unit with the help of D-Flip flop and decoders. [16]

PS	NS	
	X = 0	X = 1
000	011,0	100,1
001	001,0	100,1
010	010,0	000,1
011	001,0	010,1
100	010,0	011,0

4. Implement the following functions using appropriate DECODER
   F1 = Σm(2,4,6,8,12)
   F2 = Σm(1,3,6,7,9,10)
   F3 = Σm(1,3,4,5,6,9,12,14)
   F4 = Σm(2,4,8) [16]

5. Determine the logic function produced by A and B when applied to A water pump is required to turn ON automatically whenever the water level in any two or more of three tanks A, B and C falls below a pre-set level. Each water tank is provided with a level detector that generates a HIGH voltage whenever the water level in that tank is LOW. Derive a Switching function with minimum number of literals to implement the above situation. [16]

6. (a) Differentiate edge triggering, Level triggering and Pulse triggering.

(b) Design a clocked JK flip flop. Explain its operation with the help of characteristic table and characteristic equation. Give the symbol of edge triggered JK flipflop. [8+8]

7. Determine a minimal state table equivalent to the state table given below. [16]

PS	NS,Z	
	J1	J2
I1	I4,0	I2,1
I2	I7,0	I1,0
I3	I4,0	I2,1
I4	I3,0	I2,1
I5	I4,0	I1,1
I6	I5,1	I6,1
I7	I5,1	I6,1

8. (a) Give a brief description about the following number systems with suitable examples.
   i. Decimal number system
   ii. Binary number system
   iii. Octal number system
   iv. Hexadecimal system

   (b) i. Convert $(2598.675)_{10}$ to hexadecimal
   ii. Convert $(10010.1011)_2$ to decimal
   iii. Convert $(10111101.01101001)_2$ to octal
   iv. Convert $(465.0647)_8$ to Binary. [8+8]

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Code No: 07A4EC09 **R07** **Set No. 3**

II B.Tech II Semester Examinations,April/May 2012
SWITCHING THEORY AND LOGIC DESIGN
Common to Electronics And Telematics, Electronics And Communication Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Implement the following functions using appropriate DECODER
   F1 = Σm(2,4,6,8,12)
   F2 = Σm(1,3,6,7,9,10)
   F3 = Σm(1,3,4,5,6,9,12,14)
   F4 = Σm(2,4,8) [16]

2. (a) Differentiate edge triggering, Level triggering and Pulse triggering.
   (b) Design a clocked JK flip flop. Explain its operation with the help of characteristic table and characteristic equation. Give the symbol of edge triggered JK flipflop. [8+8]

3. Determine a minimal state table equivalent to the state table given below. [16]

PS	NS,Z	
	J1	J2
I1	I4,0	I2,1
I2	I7,0	I1,0
I3	I4,0	I2,1
I4	I3,0	I2,1
I5	I4,0	I1,1
I6	I5,1	I6,1
I7	I5,1	I6,1

4. (a) Draw the block diagram of a ROM. Define address and word. Relate the number of output lines with number of bits in a word. How an output word can be selected?
   (b) For a 64×8 ROM, determine the number of words it contains and the size of eah word. How many output lines are there for the ROM? [8+8]

5. Determine the logic function produced by A and B when applied to A water pump is required to turn ON automatically whenever the water level in any two or more of three tanks A, B and C falls below a pre-set level. Each water tank is provided with a level detector that generates a HIGH voltage whenever the water level in that tank is LOW. Derive a Switching function with minimum number of literals to implement the above situation. [16]

6. Draw an ASM chart for the state table given below. Design a control unit with the help of D-Flip flop and decoders. [16]

PS	NS	
	X = 0	X = 1
000	011,0	100,1
001	001,0	100,1
010	010,0	000,1
011	001,0	010,1
100	010,0	011,0

7. (a) Give a brief description about the following number systems with suitable examples.
   i. Decimal number system
   ii. Binary number system
   iii. Octal number system
   iv. Hexadecimal system

   (b) i. Convert $(2598.675)_{10}$ to hexadecimal
   ii. Convert $(10010.1011)_2$ to decimal
   iii. Convert $(10111101.01101001)_2$ to octal
   iv. Convert $(465.0647)_8$ to Binary. [8+8]

8. (a) Express the Boolean function:
   F(x,y,z) = xy +x′z in a product of maxterm form

   (b) How many rows will be there in the truth table of a logic system having n input binary variable?

   (c) Prepare the truth table for the Boolean function
   F(X, Y , Z) = X(YZ′ + Y′Z) [8+2+6]

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