

KADI SARVA VISHWAVIDHYALAYA

B.E.Semester III EXAMINATION (APRIL/2015)

Subject Code: EC-304

Subject Name: Digital Logic Design

Date: 16/04/2015

Time: 10:30 to 1:30p.m.

Total Marks: 70 Marks

Instructions:

1. Answer each section in separate Answer sheet.
2. Use of Scientific calculator is permitted.
3. All questions are Compulsory.
4. Indicate clearly, the options you attempt along with its respective question number.
5. Use the last page of main supplementary of rough work.

Section-I

Q:1 (All Compulsory)

- (A) Convert decimal digit 2 to its equivalent BCD, excess-3 code and 84-2-1 code. [5]
(B) Convert $(10110001101011.11110010)_2 = (\underline{\hspace{2cm}})_{16}$ [5]
(C) Explain De morgan's theorems. [5]

OR

- (C) Prove that $(x+xy=x)$. [5]

Q:2 Answer the following question.

- (A) Express the Boolean function $F=xy+x'z$ in a product of maxterm form. [5]
(B) Simplify the Boolean function using k-map method. [5]
 $F(A,B,C,D,E)=\sum(0,2,4,6,9,11,13,15,17,21,25,27,29,31)$

OR

- (A) Implement following function using NAND gates only. $F=AC'+ACE+A'CD'$ [5]
(B) Simplify the Boolean function using k-map method. $F(A,B,C,D)=\sum(0,1,2,8,10,11,14,15)$ [5]

Q:3 Answer the following question.

- (A) Write down short note about full adder circuit. [5]
(B) Write down short note about magnitude comparator. [5]
- OR
- (A) Write down short note about full subtractor circuit. [5]
(B) Design a combinational circuit that accepts a three bit number and generates an output binary number equal to the square of the input number. [5]

Section 2

Q:4 (All Compulsory)

- (A) Explain the difference between combinational and sequential circuits. [5]
(B) Explain the difference between flip-flop and latch. [5]
(C) Design a 4×16 decoder constructed with two 3×8 decoders. [5]

OR

- (C) Write down a short note about 1×4 demultiplexer.

[5]

Q:5 Answer the following question.

- (A) Explain JK flipflop in detail.

[5]

- (B) A sequential circuit has two flipflops(A and B),two inputs(x and y),and an output (z).The flip flop input functions and the circuit output function are as follows:
 $JA=XB + y'B'$, $KA=xy'B'$, $JB=xA'$, $KB=xy'+A$, $z=xyA + x'y'B$. Obtain the logic diagram and state table.

[5]

OR

- (A) Explain operation of the D type edge triggered flipflop.

[5]

- (B) Explain the terms integrated circuit ,SSI,MSI,LSI and VLSI.

[5]

Q:6 Answer the following question.

- (A) Explain binary up-down counter in detail.

[5]

- (B) Explain nand gate and nor gate using CMOS logic.

[5]

OR

- (A) What is shift register?Explain shift right and shift left operation.

[5]

- (B) Draw the block diagram of a memory unit.

[5]

KADI SARVA VISHWAVIDHYALAYA

B.E.Semester III EXAMINATION (NOV/2015)

Subject Code: EC-304

Subject Name: Digital Logic Design

Date: 05/12/2015

Time: 10:30 to 1:30p.m.

Total Marks: 70 Marks

Instructions:

1. Answer each section in separate Answer sheet.
2. Use of Scientific calculator is permitted.
3. All questions are Compulsory.
4. Indicate clearly, the options you attempt along with its respective question number.
5. Use the last page of main supplementary of rough work.

Section-I

Q:1 (All Compulsory)

- (A) Convert 11010111.110 to decimal and hexadecimal. [5]
(B) Explain De morgan's theorem. [5]
(C) Obtain the 9's and 10's complement of the decimal number 13579. [5]
- OR
- (C) Obtain 1's and 2's complement of binary number 1010101. [5]

Q:2 Answer the following question.

- (A) Express the Boolean function $F=A+B'C'$ in a sum of minterms. [5]
(B) Simplify the Boolean function: $F(w,x,y,z)=\sum(2,3,12,13,14,15)$ using k-map method. [5]
- OR
- (A) Implement the Boolean function $F=xy+x'y'+y'z$ with only OR and NOT gates. [5]
(B) Simplify the following function using k-map. $F=w'xz+w'yz+x'yz'+wxy'z$, $D=wyz$ [5]

Q:3 Answer the following question.

- (A) Design a combinational circuit that accepts a three bit number and generates an output binary number equal to the square of the input number. [5]
(B) What is Multiplexer? With logic circuit and function table explain the working of 4 to 1 line multiplexer. [5]
- OR
- (A) Explain full adder circuit in detail. [5]
(B) Explain PLA in detail. [5]

Section 2

Q:4 (All Compulsory)

- (A) Differentiate Combinational logic and sequential logic circuits. [5]
(B) Write a short note on look ahead carry generator. [5]
(C) Explain clocked RS flip flop in detail. [5]
- OR
- (C) Explain working of clocked master-slave JK flip flop in detail. [5]

Q:5 Answer the following question.

- (A) Explain working of 3 bit binary counter. [5]
(B) Simplify the following Boolean function using tabulation method. [5]
- $$F(w,x,y,z) = \sum(1,4,6,7,8,9,10,11,15)$$
- OR
- (A) Explain the working of 4 bit binary ripple counter. [5]
(B) Define the different mode of operation of registers & explain any one in detail. [5]

Q:6 Answer the following question.

- (A) Explain CMOS inverter in detail. [5]
(B) Discuss Interregister Transfer in detail. [5]
- OR
- (A) Explain CMOS NAND gate in detail. [5]
(B) Explain the working of DTL basic gates. [5]

KADI SARVA VISHWAVIDHYALAYA

B.E. Semester: III

SUBJECT CODE:-EC-304

SUBJECT NAME: - DIGITAL LOGIC DESIGN

DATE:27/11/2013

TIME:10:00AM To 1:00PM

TOTAL MARKS: 70

Instructions:

1. Answer each section in separate answer sheet.
2. Use of scientific calculator is permitted.
3. All Questions are **compulsory**.
4. Indicate **clearly**, the options you attempt along with its respective question number.
5. Use the last page of main supplementary of **rough work**.

Section -I

Q-1 (All Compulsory)

- (A) Convert decimal 225.225 to binary, octal and hexadecimal. [5]
(B) Explain Arithmetic addition and arithmetic subtraction.(with example.) [5]
(C) Convert the following numbers to decimal (i) $(10001.101)_2$ (ii) $(101011.11101)_2$ (iii) $(0.365)_8$ (iv) A3E5 (v) CDA4 (vi) $(11101.001)_2$

OR

- (C) Using 2's complement perform (i) $(11010)_2 - (10000)_2$. [5]
(ii) $10010 - 10011$

Q-2 Answer the following question.

- (A) Demonstrate the validity of De Morgan's theorems by means of truth tables for three variables. What is duality principle? Show that the dual of the Exclusive-OR is equal to its complement. [5]

- (B) Draw symbol and construct the truth table for three input AND gate and Ex-OR gate. [5]

OR

- (A) Explain NAND and NOR as a universal gates. [5]

- (B) Given Boolean function $F = xy + x'y' + y'z$ [5]
1. Implement it with only OR & NOT gates
2. Implement it with only AND & NOT gates

Q-3 Answer the following question.

- (A) Simplify the following Boolean function using Karnaugh map: [5]
 $F(A, B, C, D) = ABD + A'C'D' + A'B + A'CD' + AB'D'$.

- (B) Implement the following Boolean functions (i) $F = A(B + CD) + BC'$ with NOR gates (ii) $F = (A + B')(CD + E)$ with NAND gates [5]

OR

- (A) Simplify the Boolean function:
(1) $F(w,x,y,z) = \Sigma(2,3,12,13,14)$
(2) $F(w,x,y) = \Sigma(0,1,3,4,5,7)$ [5]

- (B) Simplify the following Boolean function using K-map $F(w,x,y,z) = \Sigma(1, 3, 7, 11, 15)$ with don't care conditions $d(w,x,y,z) = \Sigma(0, 2, 5)$ [5]

Section -II

Q-4 (All Compulsory)

- (A) Design the Combinational Circuits for Binary to Gray Code Conversion. [5]
(B) With logic diagram and truth table explain the working of 3 to 8 line decoder. [5]
(C) Design a combination circuits for a full adder. [5]

OR

- (C) Write short note on logic families.(RTL,DTL,TTL,ECL,IIL). [5]

Q-5 Answer the following question.

- (A) Explain the JK flip-flop and What is race around condition in flip flops? [5]
(B) What is the function of shift register? With the help of simple diagram explain its working. With block diagram and timing diagram explain the serial transfer of information from register A to register B. [5]

OR

- (A) Differentiate Combinational logic and sequential logic circuits. [5]
(B) Construct Boolean function $F = A(B+CD) + BC'$ using only NOR gates. [5]

Q-6 Answer the following question.

- (A) Write short note on: Read Only Memory (ROM). [5]
(B) What is multiplexer? Implement the following function with a multiplexer: $F(A,B,C,D) = \Sigma(0, 1, 3, 4, 8, 9, 15)$ [5]

OR

- (A) Explain 4-bit magnitude comparator. [5]
(B) Explain 4-bit up-down binary synchronous counter. [5]

----- All the Best -----

KADI SARVA VISHWAVIDYALAYA

B.E. SEMESTER 3RD EXAMINATION (APRIL-2014)

SUBJECT CODE: EC-304

DATE: 26/4/2014

TIME: 10.30 AM TO 1.30 PM

SUBJECT NAME: DIGITAL LOGIC DESIGN

TOTAL MARKS: 70

Instructions:

1. Answer each section in separate answer sheet.
2. Use of scientific calculator is permitted.
3. All questions are compulsory.
4. Indicate clearly, the options you attempted along with its respective question number.
5. Use the last page of main supplementary for rough work.

Section-1

Q: 1 (All Compulsory)

- (A) Convert the hexadecimal number 2AC5.D to decimal, octal and binary. [5]
- (B) Explain the term digital computer with block diagram. [5]
- (C) Obtain the 1's and 2's complement of 10000 and 00000. [5]
- OR
- (C) Convert the binary number 1101101.111 and 10.10001 to its equivalent decimal. [5]

Q: 2 Answer the following question.

- (A) Prove the theorem $x \cdot x = x$. [5]
- (B) Simplify the boolean function $F(w,x,y,z) = \sum(1,3,7,11,15)$ using k-map method. [5]

OR

- (A) Prove that NAND gate is universal gate. [5]
- (B) Express the following function in product of maxterm.
$$F(x,y,z) = (xy+z)(y+xz)$$
 [5]

Q: 3 Answer the following question.

- (A) Explain with neat diagram the circuit of full subtractor. [5]
- (B) Implement a full adder circuit with a decoder and two

OR gates. [5]

OR

(A) Implement the function $F(A,B,C)=\sum(1,3,5,6)$ with a multiplexer. [5]

(B) Write short note on ROM. [5]

Section – 2

Q: 4 (All Compulsory)

(A) Write down the difference between combinational and sequential logic circuit. [5]

(B) Explain the working of 3 to 8 line decoder. [5]

(C) Explain the working of D flipflop. [5]

OR

(C) Explain the working of T flip flop. [5]

Q: 5 Answer the following question.

(A) Explain 4 bit binary ripple counter. [5]

(B) Explain the different mode of operation of registers in detail. [5]

OR

(A) Explain 4 bit up down binary synchronous counter. [5]

(B) Explain in detail bidirectional shift register with parallel load. [5]

Q: 6 Answer the following question.

(A) Define the terms state table, state equation, state diagram and input & output equations. [5]

(B) Explain RTL logic in detail. [5]

OR

(A) Define the terms noise margin and propagation delay. [5]

(B) Write short note on TTL logic. [5]

KADI SARVA VISHWAVIDYALAYA
B.E. SEMESTER -III EXAMINATION (NOV/2014)

SUBJECT CODE: EC-304
DATE: 17/11/2014

SUBJECT NAME: Digital Logic Design
TIME: 10:30pm to 01:30pm

TOTAL MARKS: 70

Instructions:

1. Answer each section in separate answer sheet
2. Use of scientific Calculator is permitted.
3. All questions are compulsory.
4. Indicate **clearly**, the options you attempted along with its respective question number
5. Use of last page of main supplementary for rough work.

Section-1

Q:1 (All Compulsory)

- (A) Draw the block diagram of a digital computer and explain it. 05
- (B) Find out 1's and 2's complement of the following binary numbers. 05
(1)0000001 (2)0111000
- (C) Convert the following octal numbers to hexadecimal. 05
(1) 256 (2) 2035 (3) 1762.46

OR

- (C) Add the following binary number. 05
1011+1101+1001+1111

Q:2 Answer the following questions:

- (A) Implement the following Boolean function with only OR and NOT gates. 05
 $F=xy+x'y'+y'z$
- (B) Simplify the following Boolean expression to four literals. 05
 $F=(A+C+D)(A+C+D')(A+C'+D)(A+B')$
OR
- (A) Implement the following Boolean function using NAND gates only. 05
 $F=w'xz+w'yz+x'yz'+wxy'z$
- (B) Express the Boolean function $F=xy+x'z$ in a product of maxterm form. 05

Q:3 Answer the following questions:

- (A) Find out simplified expression in sum of products using k-map method. 05
 $F(A,B,C,D)=(4,6,7,15)$

(B) Implement full adder circuit by using two half adder circuit. 05

OR

(A) Simplify the following Boolean expression using tabulation method. 05
 $F = \sum(2, 3, 12, 13, 14, 15)$

(B) Design a combinational circuit that converts a decimal digit from BCD code to excess-3 code. 05

Section-2

Q:4 (All Compulsory)

(A) Write a short note about 3 to 8 line decoder. 05

(B) Write a short note about D flipflop. 05

(C) Write a short note about clocked RS flipflop. 05

OR

(C) Implement the following function using 8*1 multiplexer. 05
 $F(A, B, C, D) = \sum(0, 1, 3, 4, 8, 9, 15)$

Q:5 Answer the following questions:

(A) Write a short note on 4 bit register with parallel load. 05

(B) Write a short note on 4 bit up-down binary counter. 05

OR

(A) Write a short note on shift registers. 05

(B) Write a short note on Johnson counter. 05

Q:6 Answer the following questions:

(A) Explain the difference between combinational circuits and sequential circuits. 05

(B) Explain the following terms: 05
(1) Fan out (2) Power dissipation (3) Propagation delay (4) Noise margin

OR

(A) Explain briefly: 05
(1) logic and shift micro operations (2) fixed-point binary data and floating-point data

(B) Write a short note on CMOS NAND gate circuit. 05

ALL THE BEST