

UNCC – ECGR2181- Midterm Exam 1 – October 9, 2009

A

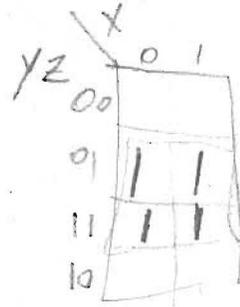
Name: KEY Mosaic User ID KEY

You are permitted 75 minutes to take this test, no more. You are allowed the following items for the test: single sheet of paper with notes, pencils and erasers. You are not permitted to have any of the following on your desk during the test: calculator, books, notes, homework, labs computer, cell phone, or other electronic assistance. Failure to abide by this policy will result in a zero for the test and a visit to the UNC Charlotte honor board. Put your answers on the scan sheet and the paper provided (pages 3 to 7 of the test), and turn in the scan sheet and the answer pages - use only that paper.

For these multiple choice and True/False problems, circle the SINGLE best answer (letter and answer) for each problem. Multiple choice are 5 points, true/false are worth 2 points.

1) What is the 8 bit, 2's complement, binary number representing negative 2?

- a. 11111101 = -3
- b. 00000010 = 2
- c. 11111110 = -2
- d. 11111100 = -4
- e. 01111101 = 125

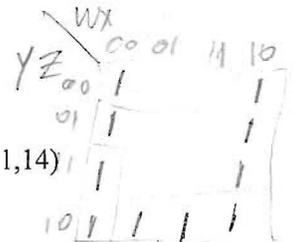


2) Simplify the theorem: $F = X'Y'Z + X'YZ + XY'Z + XYZ$

- a. $Y'(X'Z) + Y(X'Z) + Y'(XZ) + Y(XZ)$
- b. $YZ' + XZ$
- c. $X'Z + XZ$
- d. Z
- e. None of the above

3) Represent the decimal number 894 in the following order: Binary, Octal and Hexadecimal?

- a. 1011111000, 1687, 48F
- b. 1110111111, 1576, 37E
- c. 1101111110, 1586, 37E
- d. 1101111110, 1576, 37E
- e. None of the above



4) Find a minimal sum of products expression for the function: $F = \sum W, X, Y, Z (0, 1, 2, 3, 6, 8, 9, 10, 11, 14)$

- a. $F = X'Y' + YZ$
- b. $F = W' + YZ'$
- c. $F = W' + X' + YZ'$
- d. $F = X' + YZ'$
- e. None of the above

5) Given a digital system with 8 inputs, how many different variations are there for those 8 inputs?

- a. 6
 - b. 8
 - c. 16
 - d. 64
 - e. None of the above
- $2^8 = 256$

6) What type of circuit is characterized by only active components with no memory?

- a. Sequential
- b. Combinational
- c. Holistic
- d. Schematic
- e. None of the above

7) What is the name of the device at the right?

- a. NOR
- b. NAND
- c. XOR
- d. Decoder
- e. None of the above



8) Which of the following gates produces the same output?

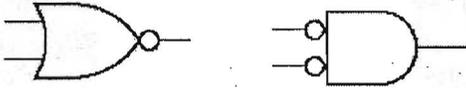
a.



b.



c.



d.

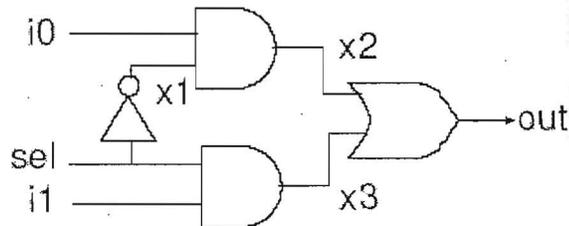


e. None of the above.

A	B	NOR	SPECIAL AND
0	0	1	0
0	1	0	1
1	0	0	1
1	1	0	1

9) The circuit to the right is a diagram of a:

- a. 8-to-3 encoder
- b. 3-to-8 decoder
- c. adder
- d. 2-to-1 multiplexer**
- e. 2-to-4 decoder

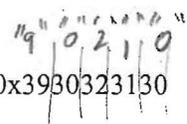


10) Which of the following is not a Boolean algebra property?

- a. $a + b = b + a$
- b. $a + (b * c) = (a + b) * (a + c)$
- c. $1 * a = a * 1 = a$
- d. $(ab)' = a' + b'$
- e. $a + a = a$
- f. All of these are valid properties**

11) The ASCII string "90210" is represented by the values 0x3930323130

TRUE FALSE



12) VHDL, Verilog, and Xilinx are all examples of software languages used to synthesize computer circuits.

TRUE **FALSE**

VHDL & Verilog are hardware description languages

13) Any Boolean function can be implemented using just XNOR gates.

TRUE **FALSE**

NAND - yes

14) The operation of adding the 8-bit 2's complement number 0x8F to the 8-bit 2's complement number 0xD0 and storing the result in a the 8-bit 2's complement number will result in overflow.

TRUE FALSE

15) The sign extension of the 8-bit 2's complement number 0xFF to a 16-bit 2's complement number is 0x80FF.

TRUE **FALSE**