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

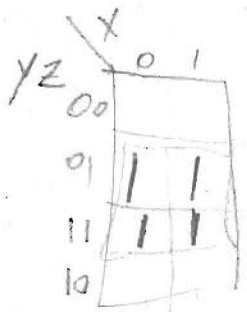
A

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.

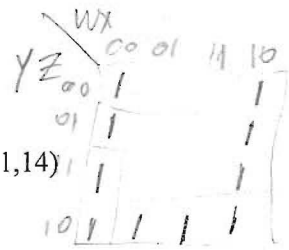
1) What is the 8 bit, 2's complement, binary number representing negative 2?
   a. 11111101 = −3
   b. 00000010 = 2
   c. 11111110 = −2
   d. 11111100 = −4
   e. 01111101 = 125



1 3 5 7

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=ΣW,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

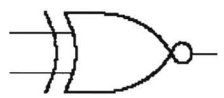
5) Given a digital system with 8 inputs, how many different variations are there for those 8 inputs?
   a. 6
   b. 8
   c. 16
   d. 64
   e. None of the above

$2^8 = 256$

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

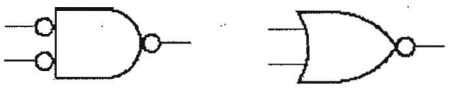
7) What is the name of the device at the right?
   a. NOR
   b. NAND
   c. XOR
   d. Decoder
   e. None of the above

XNOR

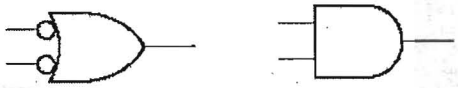


8) Which of the following gates produces the same output?

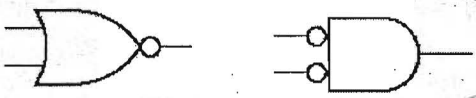
a.



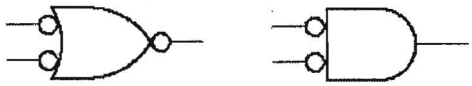
b.



c.



d.

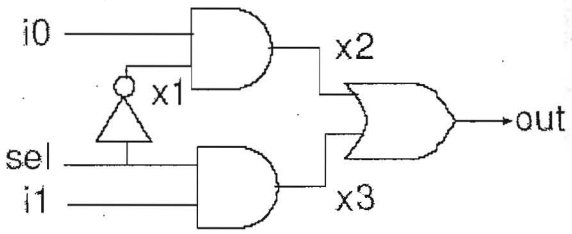


e. None of the above.

A B	NOR	Special AND
0 0	1	0
0 1	0	1
1 0	0	1
1 1	0	1

9) The circuit lo 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

"90210" 0 2 1 0

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

TRUE FALSE

12) VHDL, Verilog, and Xillinx 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