Unit 3 - Week 1

Assignment 1

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-02-12, 23:59 IST.

1) Which of the following is(are) true for CMOS p-transistor? *1 point*

- [ ] When gate is 0, the transistor is OFF.
- [ ] When gate is 0, the transistor is ON.
- [ ] When gate is 1, the transistor is OFF.
- [ ] When gate is 1, the transistor is ON.

No, the answer is incorrect.
Score: 0
Accepted Answers:
When gate is 0, the transistor is ON.
When gate is 1, the transistor is OFF.

2) How many minimum number of transistors (both p and n) are required to construct a CMOS AND gate? *1 point*

- ( ) 2
- ( ) 4
- ( ) 6
- ( ) 8

No, the answer is incorrect.
Score: 0
Accepted Answers:
6

3) Which of the following statements are CORRECT? *1 point*

- [ ] The set of gates {AND, OR, NOT} is a functionally complete set.
- [ ] The set of gates {AND, OR} is a functionally complete set.
- [ ] The set of gates {NOT, OR} is a *minimally* functionally complete set.
- [ ] AND gate can be built using OR and NOT gates.

No, the answer is incorrect.
Score: 0
Accepted Answers:
The set of gates {AND, OR, NOT} is a functionally complete set.
The set of gates {NOT, OR} is a minimally functionally complete set.
AND gate can be built using OR and NOT gates.

4) Given below is the truth table for XOR gate. A, B, C, D are outputs for inputs given. Choose the 4 digit number ABCD from the options below. *1 point*

x	y	out
0	0	A
0	1	B
1	0	C
1	1	D

- ( ) 1001
- ( ) 0110
- ( ) 1100
- ( ) 0011

No, the answer is incorrect.
Score: 0
Accepted Answers:
0110

5) Which of the following is(are) CORRECT for any circuit? *1 point*

- [ ] .hdl file is used to describe the circuit.
- [ ] .tst file contains the script to verify the circuit described in .hdl file.
- [ ] .cmp file contains the truth table for the circuit.
- [ ] None of the above

No, the answer is incorrect.
Score: 0
Accepted Answers:
.hdl file is used to describe the circuit.
.tst file contains the script to verify the circuit described in .hdl file.
.cmp file contains the truth table for the circuit.

6) What is the *minimum* number of NOR gates needed to build a NAND gate? *1 point*

- ( ) 4
- ( ) 5
- ( ) 6
- ( ) 7

No, the answer is incorrect.
Score: 0
Accepted Answers:
4

7) Which of the following gates is described in the given HDL code. *1 point*

```
IN a, b;
OUT out;
Nand(a=a, b=a, out=na);
Nand(a=b, b=b, out=nb);
Nand(a=na, b=nb, out=nout);
Nand(a=nout, b=nout, out=out);
```

- ( ) NOR
- ( ) AND
- ( ) OR
- ( ) XOR

No, the answer is incorrect.
Score: 0
Accepted Answers:
NOR

8) What is the *minimum* number of select bits needed to build a 16-way multiplexor? *1 point*

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 4

9) Which of the following logic describes the output "a" of 2-way demultiplexor `( IN in, sel;OUT a, b; if(sel==0):a=in; if(sel==1):b=in)`? *1 point*

- ( ) $in.\ sel$
- ( ) $\overline{in}.\ sel$
- ( ) $in.\ \overline{sel}$
- ( ) $\overline{in}.\ \overline{sel}$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$in.\ \overline{sel}$

10) Which of the following gates can be realised using a 2-bit Mux? *1 point*
(**Hint:** You can provide constant inputs (0 and 1) to any of Mux's input signals)

- [ ] AND
- [ ] OR
- [ ] NOT
- [ ] XOR

No, the answer is incorrect.
Score: 0
Accepted Answers:
AND
OR
NOT