

Exam 1 –Chapters 1-4 & Notes

Total Points: 20

Directions: Make sure all questions are clearly numbered and answered in one file to upload. Also, add your name to the top of the first exam page.

Short Answer. Show work for problems 1-10. (20 pts @ 2pts each)

Note: Only half credit will be given for giving a correct answer without showing work. Wrong answers or no answers will lose the full two points. No partial credit for an attempt with wrong answers.

All provided code segments/images are intended to be syntactically correct, unless otherwise stated (e.g., error is an answer).

1. What is 23_6 (base 6) minus 23_4 (base 4) and express the answer in base 10.

2. Find the value of the following 8-bit two's complement binary number:

11001010

3. Using the Hamming Algorithm with EVEN parity, find the position of the error and the corrected data string.

1001 0001 0010

4. Simplify (minimize) the expression below using Boolean Algebra:

$$(A \oplus B) * (\bar{A} + B)$$

5. List all the ordered pairs that make the following expression true:

$$\overline{\bar{A} + \bar{B}}$$

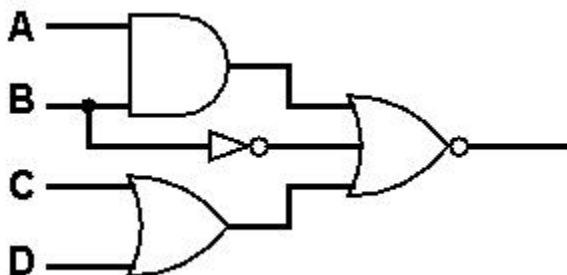
6. Write the Boolean expression in Sum of Product (SOP) form represented by the truth table below:

A	B	C	Output
0	0	0	0
0	0	1	1
0	1	0	0
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	1

7. Write the simplified (minimized) expression for the Boolean function defined by the following Karnaugh Map (KMap) in Sum of Product (SOP) form.

		yz			
		00	01	11	10
wx	00	0	1	0	1
	01	0	1	1	1
	11	1	1	0	0
	10	1	1	0	1

8. What is the Boolean expression represented by the following digital circuit:



9. Draw the circuit diagram for the following expression:

$$(A \oplus B) + \overline{(\bar{B} * C)}$$

10. What is the final value of C when the program is run?

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A      DC      4
B      DC      120
C      DC      0
TOP    LOAD    C
      ADD      = 1
      STORE    C
      LOAD     B
      SUB      A
      SUB      A
      SUB      A
      STORE    B
      LOAD     B
      SUB      A
      BG       TOP
      END

```