CPE201 Midterm 1 (100 points)

Answer all questions completely. Put a box around the final solution. Put your name on it. Show your work.

1. Convert the following binary number to floating point format. Give your answer as 4 hexadecimal bytes. (20 points)

   -11011101.00010100010111111001

2. Given the combinational logic circuit in Figure 1:
   a. Give the Boolean expression for 1, 2, 3, 4, and the Output. (20 points)
   b. Complete the truth table for the circuit. (40 points)

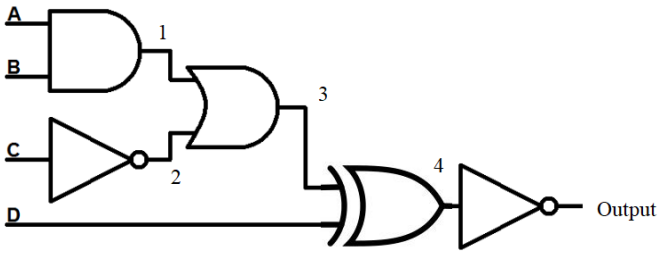
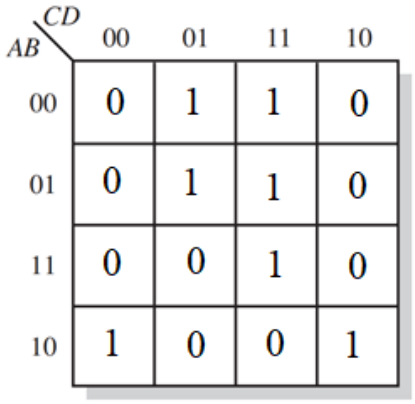



Figure 1

| A | B | C | D | 1 | 2 | 3 | 4 | Output |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | | | | | |
| 0 | 0 | 0 | 1 | | | | | |
| 0 | 0 | 1 | 0 | | | | | |
| 0 | 0 | 1 | 1 | | | | | |
| 0 | 1 | 0 | 0 | | | | | |
| 0 | 1 | 0 | 1 | | | | | |
| 0 | 1 | 1 | 0 | | | | | |
| 0 | 1 | 1 | 1 | | | | | |
| 1 | 0 | 0 | 0 | | | | | |
| 1 | 0 | 0 | 1 | | | | | |
| 1 | 0 | 1 | 0 | | | | | |
| 1 | 0 | 1 | 1 | | | | | |
| 1 | 1 | 0 | 0 | | | | | |
| 1 | 1 | 0 | 1 | | | | | |
| 1 | 1 | 1 | 0 | | | | | |
| 1 | 1 | 1 | 1 | | | | | |

3. Determine the minimum SOP expression for the Karnaugh map in Figure 2. (20 points)



| AB \ CD | 00 | 01 | 11 | 10 |
|---|---|---|---|---|
| 00 | 0 | 1 | 1 | 0 |
| 01 | 0 | 1 | 1 | 0 |
| 11 | 0 | 0 | 1 | 0 |
| 10 | 1 | 0 | 0 | 1 |

Figure 2