Name:

Date:

Class: CS 160

Assignment #3

1) Compute the following problems using **regular binary** (Keep answers in 8-bit binary). (Four Points)

1. 100001012 + 001101012 = **10111010**2
2. 000001112 + 010011112 = **01010110**2
3. 111000002 + 000101102 = **11110110**2
4. 000000112 + 000010002 = **00001011**2
5. 111011002 – 001001102 = **11000110**2
6. 110011002 – 001111002 = **10010000**2
7. 111000002 – 000011112 = **11010001**2
8. 001100002 – 000000112 = **00101101**2

2) Compute the following addition problems using **two’s complement** (Keep answers in two’s comp. 4-bit binary). (Four Points)

1. 01012 + 00102 = **0111**2
2. 00012 + 01002 = **0101**2
3. 01002 + 11102 = **0010**2
4. 10112 + 01012 = **0000**2
5. 11002 + 11112 = **1011**2
6. 11102 + 01102 = **0100**2
7. 10002 + 00112 = **1011**2
8. 00102 + 01002 = **0110**2

3) Compute the following subtraction problems using two’s complement (Keep answers in two’s comp. 4-bit binary). (Four Points)

1. 01112 – 00112 = **0100**2
2. 00002 – 11102 = **0010**2
3. 00112 – 00012 = **0010**2
4. 11002 – 00112 = **1001**2
5. 11112 – 01012 = **1010**2
6. 11002 – 00012 = **1011**2
7. 10112 – 11012 = **1110**2
8. 11102 – 00102 = **1100**2

4) Create a 4-bit two’s complement table. (Four Points)

|  |  |
| --- | --- |
| **0111**2 | **7**10 |
| **0110**2 | **6**10 |
| **0101**2 | **5**10 |
| **0100**2 | **4**10 |
| **0011**2 | **3**10 |
| **0010**2 | **2**10 |
| **0001**2 | **1**10 |
| **0000**2 | **0**10 |
| **1111**2 | **-1**10 |
| **1110**2 | **-2**10 |
| **1101**2 | **-3**10 |
| **1100**2 | **-4**10 |
| **1011**2 | **-5**10 |
| **1010**2 | **-6**10 |
| **1001**2 | **-7**10 |
| **1000**2 | **-8**10 |

5) Create an ***excess 8*** notation table. (Four Points)

|  |  |
| --- | --- |
| **1111**2 | **7**10 |
| **1110**2 | **6**10 |
| **1101**2 | **5**10 |
| **1100**2 | **4**10 |
| **1011**2 | **3**10 |
| **1010**2 | **2**10 |
| **1001**2 | **1**10 |
| **1000**2 | **0**10 |
| **0111**2 | **-1**10 |
| **0110**2 | **-2**10 |
| **0101**2 | **-3**10 |
| **0100**2 | **-4**10 |
| **0011**2 | **-5**10 |
| **0010**2 | **-6**10 |
| **0001**2 | **-7**10 |
| **0000**2 | **-8**10 |