CEC Robotics

Name: KEY
Date: _____

Assignment 5 – Binary and Hexadecimal Bases

1. Complete the table below by counting upward in binary and hexadecimal

Decimal	Binary	Hexadecimal
0	0000	0
1	0001	1
2	0010	2
3	0011	3
4	0100	4
5	0101	5
6	0110	6
7	0111	7
8	1000	8
9	1001	9
10	1010	A
11	1011	B
12	1100	C
13	1101	D
14	1110	E
15	1111	F

2. Complete the table below by doubling

n	2^n
0	1
1	2
2	4
3	8
4	16
5	32
6	64
7	128
8	256

3. Convert each given binary value to hexadecimal and decimal

a) 0b 0100 0011
0x 4 3 (convert to hexadecimal)
67 (convert to decimal)

b) 0b 1110 1010
0x E A (convert to hexadecimal)
234 (convert to decimal)

c) 0b 1001 1000
0x 9 8 (convert to hexadecimal)
152 (convert to decimal)

4. Convert each given hexadecimal value to binary and decimal

a) 0x 49
0b 0100 1001 (convert to binary)
73 (convert to decimal)

b) 0x 2F
0b 0010 1111 (convert to binary)
47 (convert to decimal)

c) 0x AA
0b 1010 1010 (convert to binary)
170 (convert to decimal)

5. Convert each given decimal value to binary and hexadecimal

a) 219
0b 1101 1011 (convert to binary)
0x D B (convert to hexadecimal)

b) 96
0b 0110 0000 (convert to binary)
0x 6 0 (convert to hexadecimal)

c) 125
0b 0111 1101 (convert to binary)
0x 7 D (convert to hexadecimal)

6. Find the sums of the following binary values. Convert each binary value to decimal to very that the arithmetic was valid.

a. 0b 101 → 5 (convert to decimal)

\+ 0b 111 → 7 (convert to decimal)

(add) 0b 1100 → 12 (convert to decimal)

b. 0b 110 → 6 (convert to decimal)

\+ 0b 11 → 3 (convert to decimal)

(add) 0b 1001 → 9 (convert to decimal)

c. 0b 1111 → 15 (convert to decimal)

\+ 0b 100001 → 33 (convert to decimal)

(add) 0b [illegible] → [illegible] 48 (convert to decimal)

7. Find the differences of the following binary values. Convert each binary value to decimal to very that the arithmetic was valid.

a. 0b 10100 → 20 (convert to decimal)

– 0b 1010 → 10 (convert to decimal)

(subtract) 0b 1010 → 10 (convert to decimal)

b. 0b 111100 → 60 (convert to decimal)

– 0b 11101 → 29 (convert to decimal)

(subtract) 0b 11111 → 31 (convert to decimal)

c. 0b 101111 → 47 (convert to decimal)

– 0b 1111 → 15 (convert to decimal)

(subtract) 0b 100000 → 32 (convert to decimal)