



QUESTION 1 (6 points)

Convert the following, showing your work

$$(1011000)_2$$

a. to decimal

64	32	16	8	4	2	1	Place Values
----	----	----	---	---	---	---	--------------

1	0	1	1	0	0	0	Number
---	---	---	---	---	---	---	--------

N =	64+0	+ 16+8	+0 + 0 + 0	Values
-----	------	--------	------------	--------

= **88**

$$(617.7)_8$$

b. to decimal

64	8	1	0.125	Place Values
----	---	---	-------	--------------

6	1	7	.	7	Number
---	---	---	---	---	--------

R =	384+ 8	+ 7	+ 0.875	Values
-----	--------	-----	---------	--------

= **399.875**

$$(124.02)_{10}$$

c. to binary

<u>Integral Part</u>	<u>Fractional Part</u>
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	124		02
0	62	0	04
0	31	0	08
1	15	0	16
1	7	0	32
1	3	0	64
1	1	1	28
1	0		

$$(124.02)_{10} = (1111100.000001)_2$$

$$(72.8)_{10}$$

d. to octal

Integral Part		Fractional Part	
	72		8
0	9	1	6
1	1	1	2
1	0	0	4
		0	8

$$(72.8)_{10} = (110.11)_8$$

$$(ABC)_{16}$$

e. to decimal

256	16	1	Place Values
10	11	12	Number
N =	2560+	176 + 12	Values



$$= 2748$$

$$(1411)_{10}$$

f. to hexadecimal

Integral Part	
	1411
3	88
8	5
5	0

$$(1411)_{10} = (583)_{16}$$

$$(1256)_8$$

g. to decimal

512 64 8 1 Place Values

1 2 5 6 Number

$$N = 512 + 128 + 40 + 6 \quad \text{Values}$$

$$= 686$$

$$(BB.C)_{16}$$

h. to octal

B B . C hexadecimal

0 1011 1011 . 1100 00 Binary

2 7 3 . 6 Octal

$(011110.01)_2$

i. to octal

011 110 . 010 Binary

3 6 . 2 octal

$(1011000)_2$

j. to hexadecimal

0101 1000 Binary

5 8 hexadecimal

$(456.7)_8$

k. to hexadecimal

4 5 6 . 7 octal

000 100 101 110 . 1110 binary

1 2 E . E hexadecimal

$(4E1)_{16}$

l. to binary

4 E 1 hexadecimal

0100 1110 0001 binary

QUESTION 2 (2 points)

Convert the following decimal number to binary using the alternative method discussed in example 2.17 and 2.17



CPIT 201: Introduction to Computing

CH2: Number Systems

Assignment (1) Solution

a. 255

128	64	32	16	8	4	2	1	Place Values
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1	1	1	1	1	1	1	1	Binary
---	---	---	---	---	---	---	---	--------

b. 121

128	64	32	16	8	4	2	1	Place Values
-----	----	----	----	---	---	---	---	--------------

0	1	1	1	1	0	0	1	Binary
---	---	---	---	---	---	---	---	--------

3
32

c. 12

8	4	2	1	.	16/32	8/32	4/32	2/32	1/32	Place Values
---	---	---	---	---	-------	------	------	------	------	--------------

1	1	1	1	.	0	0	0	1	1	Binary
---	---	---	---	---	---	---	---	---	---	--------

15
64

c. 4

8	4	2	1	.	32/64	16/64	8/64	4/64	2/64	1/64	Place Values
---	---	---	---	---	-------	-------	------	------	------	------	--------------

0	1	0	0	.	0	0	1	1	0	1	Binary
---	---	---	---	---	---	---	---	---	---	---	--------

QUESTION 3 (2 points)

Write the decimal equivalent of the following Roman numbers

a. *VLGG*

This is not a valid roman number, because V=5 comes before L=50, but V is not a power of ten

b. *MCLVgg*

$$1000 + 100 + 50 + 5 + 1 + 1 = 1157$$

QUESTION 4 (2 points)

Find the maximum value of an integer in each of the following cases

a. $b = 2$ $k = 12$

$$\text{Maximum Value} = 2^{12} - 1 = 4095 \text{ (for unsigned integers)}$$

b. $b = 8$ $k = 8$

$$\text{Maximum Value} = 8^8 - 1 = 16777215 \text{ (for unsigned integers)}$$

