Daniel Baca, CIS-17A

Part 1.)

a.) 5.75_{10} $\quad 5_{10} = 101_2 = 5_{16} = 5_8$ $\quad .75 \times 16 = 12.0$

$.75_{10} = .C_{16} = .1100_2 = .6_8$

$5.75_{10} = 5.C_{16} = 5.6_8 = 101.11_2$

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b. 0.9_{10} $\quad 0_{10} = 0_{16} = 0_2 = 0_8$

$0.9 \times 16 = 14.4$
$0.4 \times 16 = 6.4$
$0.4 \times 16 = 6.4$
$0.4 \times 16 = 6.4$

$0.9_{10} = .E6_{16} = .1110\ 0110_2 = 0.71463_8$

.1110 0110 0110 0110 0110
.7 1 4 6 3 1 4

$0.9_{10} = 0.E6_{16} = 0.1110\ 0110_2 = 0.71463_8$

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c. 99.7_{10}

128 64 32 16 8 4 2 1
0 0 0 0 0 0 0 0
1 1 0 0 0 1 1

64
+32
2
1
$= 99$

$99 = 1100011_2$
$= 63_{16}$
$= 143_8$

$0.7 \times 16 = 11.2$
$0.2 \times 16 = 3.2$
$0.2 \times 16 = 3.2$
$0.2 \times 16 = 3.2$

$0.7_{10} = .B3_{16} = 0.1011\ 0011_2 = 0.5463$

0.1011 0011 0011 0011 0
.5 4 6 3 1 4

$99.7_{10} = 63.B3_{16} = 1100011.1011\ 0011_2 = 143.54631_8$

Part 2.)

$5.75_{10} = 101.11_2$

a.) 5.75_{10} to Nasa HexFloat $\quad 101.11_2 = 0.10111 \times 2^3$

0.101 1100	0000 0000	0000 0000	0000 0011
5 12	0 0	0 0	0 3

$5.75_{10} = 5C000003$ Nasa Hex Float

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b.) 0.9_{10} to Nasa Hex Float $\quad 0.9_{10} = 0.1110\ 0110_2 \Rightarrow 0.1110\ 0110 \times 2^0$

0.111 0011	0011 0011	0011 0011	0000 0000
7 3	3 3	3 3	0 0

$0.9_{10} = 73333300$ Nasa Hex Float

c.) 99.7_{10} to NASA hexfloat $99.7_{10} = 1100011.1011\,\underline{0011}_2$

$1100011.1011\,\underline{0011} = 0.1100011\,1011\,\underline{0011} \times 2^7$

0.110	0011	1011	0011	0011	0011	0000	0111
6	3	11	3	3	3	0	7

$99.7_{10} = 63B33307$ Nasa Hex Float

Part 3.) $5.75_{10} = 101.11_2 \Rightarrow 101.11\,0000\,0000\,0000 = 1011100000000000.0_2 = 11,776$

a.)

b.) $0.9_{10} = 0.1110\,\underline{0110} \Rightarrow 0.1110\,0110\,0110\,0110\,0110 = 11100110011001100110_2 = 471,859$

c.) $99.7_{10} = 1100011.1011\,\underline{0011} \rightarrow 1100011.1011\,0011\,0011\,0011\,0011\,0011\,0011\,0011$

$= 11000111011001100110011001100110.10011$

$= 11000111011001100110011001100110.10011_2$

$= 13,381,507,482$

Part 4.) $82,432_{10} = 10100001000000000_2$

a.) $7 \times 11,776 = 82,432$ $10100\,0010\,0000\,0000 \Rightarrow 101000.01_2$

$5.75 \times 7 = 40.25_{10}$

$\overset{32\ 8\ 4\ 2\ 1}{\underset{16}{101000.01}}$ / $101000_2 = 40_{10}$ / $.01_2 = .25_{10}$ / $101000.01_2 = 40.25_{10}$

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b.) $7 \times 471,859 = 3,303,013$ $3,303,013 = 1100100110011001100101_2$

$1100\,1001\,1001\,1001\,1001\,01 = 110.01\,\underline{1001}_2$

$7 \times 0.9 = 6.3_{10}$

$110.01\,\underline{1001}_2 = 6.3_{10}$

$110_2 = 6_{10}$ /

$0.3 \times 16 = 4.8$
$0.8 \times 16 = 12.8$
$0.8 \times 16 = 12.8$
$0.8 \times 16 = 12.8$

$0.3_{10} = 0.0100\,1100\,1100\,1100$
$= 0.01\,\underline{1001}_2$

c.) $7 \times 13{,}381{,}507{,}482 = 93{,}670{,}552{,}374$ $93{,}670{,}552{,}374 = ?$

10101110011110011 0011 0011 0011 0011 0110

$7 \times 99.7 = 697.9_{10}$

1010111001111 0011 0011 0011 0011 0011 0110

$1010111001.111\underline{0011}_2 = 697.9_{10}$

1010111001.111 0011 0011 0011 0011 0011 0110

2
512
+128
32
16
8
1
= 697

256 64 16 8 4 2 1
1010111001 $= 697_{10}$
512 128 32

$.9 \times 16 = 14.4$
$.4 \times 16 = 6.4$
$.4 \times 16 = 6.4$
$.4 \times 16 = 6.4$

$0.9_{10} = E6_{16}$
$= 1110\,\underline{0110}_2$

Parts 5.)

a.) $5.75_{10} = 101.11_2$

101.11 1.0111×2^2 $127 + 2 = 129$ $129_{10} = 1000\,0001$

0100	0000	1.011	1000	0000	0000	0000	0000
4	0	11	8	0	0	0	0

5.75_{10} = 40B8 0000 IEEE 754 Format

b.) $0.9_{10} = 0.1110\,\underline{0110}_2$

$0.1110\,0110 \Rightarrow 1.110\,\underline{0110} \times 2^{-1}$ $127 - 1 = 126$

$126_{10} = 0111\,1110_2$

2
64
+32
16
8
4
2
126

0 011	1111	0.110	0110	0110	0110	0110	0110
3	F	6	6	6	6	6	6

0.9_{10} = 3F666666 IEEE 754 format

c.) $99.7_{10} = 1100011.1011\,\underline{0011}$

$1100011.1011\,\underline{0011}_2 \rightarrow 1.1000111011\,\underline{0011}_2 \times 2^6$

$127 + 6 = 133$ $133_{10} = 1000\,0101_2$

0100	0010	1.100	0111	0110	0110	0110	0110
4	2	C	7	6	6	6	6

1
128
5
133_{10}

99.7_{10} = 42C76666 IEEE 754 format