Conversion 1

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CSC 17A

1. 93 Base 10 to 2, 8, 16

Base 16:

$$16 \overline{)93}$$
$$\underline{-80}$$
$$13 \quad 1$$

5, $13_{10} = D$

$5 \times 16^1 + D \times 16^0 = 5D$

93_{10} to Base 16 is: 5D

Base 8:

$$93$$
$$\underline{-64}$$
$$29$$

$$8 \overline{)29}$$
$$\underline{-24}$$
$$5$$

3, R:5

$1 \times 8^2 + 3 \times 8^1 + 5 \times 8^0 = 135$

93_{10} to Base 8 is: 135

Base 2:

5	D
0101	1101

$= 01011101$

93_{10} to Base 2 is: 01011101

2. 93 Base 16 to 2, 8, 10

Base 10:

$$10 \overline{)93}$$
$$\underline{-90}$$
$$3$$

9

$9 \times 16^1 + 3 \times 16^0 = 3$

$9 \times 16 + 3 \times 1$

$144 + 3 = 147_{10}$

93_{16} to Base 10 is: 147

Base 2:

$9_{16} = 1001_2 + 3_{16} = 0011_2 \rightarrow 10010011_2$

So 93_{16} to Base 2 is: 10010011

Base 8:

Take Binary Form: $10010011 = 010 \mid 010 \mid 011$
and convert to octal

$\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad 2 \mid 2 \mid 3$

$= 223$

93_{16} to Base 8 is: 223

3. 156 Base 8 to 2, 10, 16

Base 2 1_8 5_8 6_8 $12_8 = A$

Convert to Binary: 001_2 101_2 $110 \times 16 = 001101110_2$

156_8 to Base 2 is: 1101110

Base 16 $1101110 = 0110 \quad 1110$

Convert Binary to Hexa 6_{16} E_{16} $= 6E$

156_8 to Base 16 is: 6E

Base 10

$$\begin{array}{r} 15 \\ 10\overline{)156} \\ -150 \\ \hline 6 \end{array} \quad R:6$$

$1 \times 8^2 + 5 \times 8^1 + 6 \times 8^0$

$64 + 40 + 6 = 110_{10}$

156_8 to Base 10 is: 110

4. 10101010 Base 2 to 8, 10, 16

Base 10   1 0 0 0 1 0 0 0 1 0 1 0

$1 \times 2^7 + 0 \times 2^6 + 1 \times 2^5 + 0 \times 2^4 + 0 \times 2^3 + 0 \times 2^2 + 1 \times 2^1 + 0 \times 2^0$

$= 128 + 32 + 0 + 8 + 0 + 2 + 0$

$= 170$

10101010_2 to Base 10 is: 170

Base 8 $10101010 = 010 \quad 101 \quad 010$

Convert Binary to Hexa 2_8 5_8 2_8 $= 252_8$

10101010_2 to Base 8 is: 252

Base 16 $10101010 = 1010 \quad 1010$

   A_{16} A_{16} $= AA_{16}$

10101010_2 to Base 16 is: AA