2.8 37,39,40   2.12 63
2.10 50
2.11 56,57,60

Physics 306   Homework #2

37). a). 38_{16} 3   8 00111000_2
         0011 1000

b). 59_{16} 5   9 01011001_2
         0101 1001

c). A14   A 1 4 101000010100_2
         1010 0001 0100

P) 5C8   5 C 8 010111001000_2
         0101 1100 1000

E). 4100   4 1 0 0 0100000100000000_2
         0100 0001 0000 0000

F). FB17 1111101100010111_2
   1111 1011 0001 0111

G). 8A9D 1000101010011101_2
   1000 1010 1001 1101

39). a). 23_{16} $16^1 \, 16^0$ $(2 \cdot 16^1) + (3 \cdot 16^0)$
                $32 + 3 = \boxed{35_{10}}$

b). 92 $9 \cdot 16^1 + 2 \cdot 16^0$
          $144 + 2 = \boxed{146_{10}}$

c). $1A_{16}$ $(1 \cdot 16^1) + (A \cdot 16^0)$ ← 10
              $16 + 10 = \boxed{26_{10}}$

D). $8D_{16} = (8 \cdot 16^1) + (D \cdot 16^0)$
          $8 \cdot 16 + (13 \cdot 1)$
          $128 + 13 = \boxed{141_{10}}$

F). $EB_{16} = (E \times 16^1) + (B \cdot 16^0)$
          $14 \cdot 16 + 11 \cdot 1$
          $224 + 11 = \boxed{235_{10}}$

E). $F3_{16}$ $F \times 16^1 + 3 \cdot 16^0$
              $15 \cdot 16 + 3 \times 1$
              $240 + 3 = \boxed{243_{10}}$

G). $5C2 = (5 \times 16^2) + (C \cdot 16^1) + (2 \cdot 16^0)$
          $5 \cdot 256 + 12 \cdot 16 + 2$
          $1280 + 192 + 2 = \boxed{1474_{10}}$

H). $700_{16} = (7 \times 16^2) + 0 + 0$
              $\boxed{1792_{10}}$

40). a). 8_{10} $\frac{8}{16} = .5$ $.5 \times 16 = \boxed{8_{16}}$

b). 14_{10} $\frac{14}{16} = .875$ $.875 \times 16 = \boxed{E_{16}}$

c). $\frac{33}{16} = 2.0625$ $.0625 \times 16 = 1$ LSB

$\frac{2}{16} = .125$ $.125 \times 16 = 2$ MSD

$33_{10} = \boxed{21_{16}}$

D). $\frac{52}{16} = 3.25$ $.25 \times 16 = 4$

$\frac{3}{16} = .1875$ $.1875 \times 16 = 3$ $52_{10} = \boxed{34_{16}}$

E). $\frac{284}{16} = 17.75$ $.75 \times 16 = 12$ C   LSB

$\frac{17}{16} = 1.0625$ $.0625 \times 16 = 1$ 1

$\frac{1}{16} = .0625$ $.0625 \times 16 = 1$ 1 $284_{10} = \boxed{11C_{16}}$

F). $\frac{2890}{16} = 180.625$ $.625 \times 16 = 10$ A

$\frac{180}{16} = 11.25$ $.25 \times 16 = 4$ 4 $\boxed{B4A_{16} = 2890_{10}}$

$\frac{11}{16} = .6875$ $.6875 \times 16 = 11$ B

G). $\frac{4019}{16} = 251.1875$ $.1875 \times 16 = 3$

$\frac{251}{16} = 15.6875$ $.6875 \times 16 = 11$ $\boxed{FB3_{16}}$

$\frac{15}{16} = .9375$ $.9375 \times 16 = 15$

H). $\frac{6500}{16} = 406.25$ $.25 \times 16 = 4$

$\frac{406}{16} = 25.375$ $.375 \times 16 = 6$ $\boxed{6500_{10} = 1964_{16}}$

$\frac{25}{16} = 1.5625$ $.5625 \times 16 = 9$

$\frac{1}{16} = .0625$ $.0625 \times 16 = 1$

50).
a). 0001 = 1
b). 0110 = 6
c). 1001 = 9
d). 0001 1000 = 18
    1   8
E). 0001 1001 = 19
    1   9

F). 0011 0010
   3   2   32
G). 0100 0101
   4   5   45
H). 1001 1000
   9   8   98
I). 1000 0111 0000
   8   7   0   870

56).
a). 11011
    101
    carry
  1 1 0 11
   0 1 10   10110

b). 1 0 0 1 0 1 0
  1 1 0 1 1 1 1   1101111

c). 1 1 1 1 0 1 1 1 1 0 1 1 1 0
  1 0 0 0 1 1 0 0 1 1 0 0 1 0   10001100110010

57).
a). 1 0 1 0
  +1 +1 +0 +0
  1 1 0 0   1100

b). 0 0 0 1 0
  +0 +0 +0 +1 +1
  0 0 0 1 1   00011

c). 1 1 0 0 0 0 1 0 0 0 1
  1 1 0 0 0 0 1 0 0 0 1   gray
  1 0 0 0 0 0 1 1 1 1 0   Binary = 1000001110_2

ASCII

60). 1001000 = H = 72   Hello. How are you?
1100101 = e = 101
1101100 = l = 108
1101100 = l   108
1101111 = o   111
0101110 = .   46
0100000 = space 32
1001000 = H   72
1101111 = o   111
1110111 = w   119
0100000 = space 32
1100001 = a   97
1110010 = r   114
1100101 = e   101
0100000 = space 32
1111001 = y   121
1101111 = o   111
1110101 = u   117
0111111 = ?   63

63). a). 10011001 0   even # of 1's is okay, odd # is incorrect
     1 23   4   correct for even parity
b). 01110 1010
    123 4 5
              Incorrect since odd # of 1's
c). 10111111 01000 1010
    12345678   correct, even # of 1's