(b) $(AF)_{16}=(10101111)_2=(257)_8$

```
      56                scratch pad      octal
    x257                6x7=              52
     502  <--P1         5x7=              43
    346   <--P2                          502  <--P1
   134    <--P3         6x5=              36
 (17562)8               5x5=              31
                                         346  <--P2
                        6x2=              14
                        5x2=              12
                                         134  <--P3
```

$(17562)_8=(001111101110010)_2$
$=(1331302)_4$

1.16 (a) $(11010.010)_2 = (0.11010010)\times 2^5$

sign bit = 0
exponent =5+127=(1000 0100)
fraction=1010 0100...0

```
0 1       8 9                 31
0|10000100|10100100.....0
```

(b)

```
2 |432            .26
2 |216   0        x 2
2 |108   0       0.52
2  |54   0        x 2
2  |27   0       1.04
2  |13   1        x 2
2   |6   1       0.08
2   |3   0        x 2
2   |1   1       0.16
     0   1        x 2
                 0.32
                  x 2
                 0.64
                  x 2
                 1.28
                  x 2
                 0.56
                   .
                   .
                   .
```

$(432.26)_{10}=(110110000.010000101000111)_2$
$=(0.110110000010000101000111)\times 2^9$

sign bit = 0
exponent =9+127=136=$(10001000)_2$
fraction =$(101100000100001010001111)_2$

```
0 1       8 9                         31
0|10001000|1011000001000010100011 1
```


(c) $-(10100111.1001)_2= -(0.101001111001)\times 2^8$

sign bit =1
exponent = 8+127=135=$(10000111)_2$
fraction =$(010011110010...0)_2$

```
0 1       8 9                 31
1|10000111|010011110010...0
```

(d) $-(236.77)_{10}=-(11101100.110001010001110)_2$
$=-(0.111011001100010100011110)\times 2^8$

sign bit =1
exponent=8+127=135=$(10000111)_2$
fraction=$(11011001100010100011110)_2$

```
0 1       8 9                     31
1|10000111|11011001100010100011110
```

1.17 (1) The entry in row two column two is in error.

```
(2) 1 0 1 1
    1 1 0 1
    1 0 1 1
    1 1 0 1
```

1.18

```
    6 3 -1 1   <--weighted
0   0 0  1 1
1   0 0  0 1
2   0 1  1 0
3   0 1  1 1
4   0 1  0 1
5   1 0  1 0
6   1 0  0 0
7   1 0  0 1
8   1 1  1 0
9   1 1  0 0
```

1.19

```
    3 2 -1 1   <--weighted
0   0 0  1 1
1   0 0  0 1
2   0 1  0 0
3   1 0  1 1
4   1 1  1 0
5   1 1  0 0
```

1.20 (a) $(0100\ 1001\ 0101\ 0111)_{bcd}=(4\ 9\ 5\ 7)_{bcd}$
(b) $(0100\ 1001\ 0101\ 0111)_2 =(18772)_{10}$
(c) Excess-3 = (1 6 2 4)
(d) ASCII Code =) 7

1.21 (a) $(356)_{10} =(101100100)_2$
=(0000 0001 0110 0100) in 16-bit register

(b) $(356)_{bcd}=(0011\ 0101\ 0110)_{bcd}$
=(0000 0011 0101 0110) in 16-bit register

(c) $(AI)_{ASCII}=(1010\ 0001\ 0101\ 0001)_{ASCII}$
=(1010 0001 0101 0001) in 16-bit register