Number Systems and Codes

EVALUATION SHEET

1. Complete the table below.

Number System	Base	Actual Values
Decimal	10	0 through 9
Octal	8	0 through 7
Binary	2	0 and 1

2. Give the actual value and place value of the digit 8 in the number 3859.

   ACTUAL VALUE = 8

   PLACE VALUE = 10^2

3. Decimal Equivalents (Circle one answer only.)

   The decimal equivalent of the *actual value* of the digit 9 in the *decimal* number 1978 is _____.

   a) 10   (b) 9   c) 81   d) 90   e) 900

   The decimal equivalent of the *place value* of the digit 9 in the *decimal* number 1978 is _____.

   a) 9   b) 90   c) 900   (d) 100   e) 1000

   The decimal equivalent of the *actual value* of the digit 5 in the *octal* number 2756 is _____.

   a) 1   b) 8   (c) 5   d) 10   e) 4

   The decimal equivalent of the *place value* of the digit 7 in the octal number 2756 is _____.

   a) 800   b) 100   c) 8   (d) 64   e) 512

   The decimal equivalent of the *place value* of the digit 1 in the *binary* number 1000 is _____.

   a) 32   b) 16   (c) 8   d) 2   e) 1

1

4. The table below contains 13 decimal numbers. Write the octal and binary equivalents for each number in the space provided. (Note that several answers are already given to you.)

Decimal	Octal	Binary
3	3	011
4	4	100
5	5	101
6	6	110
7	7	111
8	10	1000
⋮	⋮	⋮
500	764	111 "110" 100
501	765	111 110 101
502	766	111 110 110
503	767	111 110 111
504	770	111 111 000
505	771	111 111 001
506	772	111 111 010

5. Equivalents

Circle the *decimal* equivalent of each of the following *binary* numbers.

a. 101 111 110$_2$

   (1) 382$_{10}$

   2) 380$_{10}$

   3) 282$_{10}$

   4) 280$_{10}$

b. 010 010 011$_2$

   1) 139$_{10}$

   2) 136$_{10}$

   3) 146$_{10}$

   (4) 147$_{10}$

c. 111 001 000$_2$

   (1) 456$_{10}$

   2) 458$_{10}$

   3) 466$_{10}$

   4) 468$_{10}$

Circle the *octal* equivalent of each of the following *decimal* numbers:

a. 28_{10}

    1) 32_8

    2) 33_8

    (3) 34_8

    4) 35_8

b. 57_{10}

    (1) 71_8

    2) 72_8

    3) 73_8

    4) 74_8

c. 107_{10}

    1) 152_8

    (2) 153_8

    3) 162_8

    4) 163_8

Circle the *binary* equivalent of each of the following *octal* numbers:

a. 2734_8

    1) $010\ 110\ 011\ 100_2$

    ② $010\ 111\ 011\ 100_2$

    3) $010\ 111\ 010\ 101_2$

    4) $010\ 111\ 010\ 011_2$

b. 1562_8

    ① $1\ 101\ 110\ 010_2$

    2) $1\ 011\ 000\ 100_2$

    3) $1\ 101\ 111\ 010_2$

    4) $1\ 101\ 010\ 010_2$

c. 77564_8

    1) $111\ 111\ 010\ 010\ 101_2$

    2) $111\ 111\ 010\ 110\ 100_2$

    3) $111\ 111\ 101\ 110\ 101_2$

    ④ $111\ 111\ 101\ 110\ 100_2$

6. The purpose of a code such as ASCII is that it _____ . (Circle one answer only.)

    a. Allows analog machines such as analog computers to represent character information that people are trained to use.

    b. Sets standards for training computer operators in various computer languages.

    ⓒ Allows binary machines such as digital computers to represent character information that people are trained to use.

    d. Two of the above are correct.

    e. None of the above is correct.

7. Assuming even parity, only one of the following characters contains an error. (Circle the correct answer.)

   a.   11011110

   b.   1101001

   c.   01011010

   d.   11010100

   (e.) 11011100