Exercise Three

**1.15** Find the 9’s and the 10’s complement of the following decimal numbers:

(b) 63, 325, 600

(c) 25,000,000

**1.16**

(a) Find the 16’s complement of C3DF.

(b) Convert C3DF to binary.

(c) Find the 2’s complement of the result in (b).

(d) Convert the answer in (c) to hexadecimal and compare with the answer in (a).

**1.17** Perform subtraction on the given unsigned numbers using the 10’s complement of the

subtrahend. Where the result should be negative, find its 10’s complement and affix a minus

sign. Verify your answers.

(a) 4,637 - 2,579

(b) 125 - 1,800

(d) 1,631 – 745

**1.18** Perform subtraction on the given unsigned binary numbers using the 2’s complement of the subtrahend. Where the result should be negative, find its 2’s complement and affix a minus sign.

(a) 10011 - 10010 (c) 1001 - 110101 (d) 101000 – 10101

**1.20** Convert decimal +49 and +29 to binary, using the signed‐2’s‐complement representation

and enough digits to accommodate the numbers. Then perform the binary equivalent of

(+29) + (-49), (-29) + (+49), and (-29) + (-49). Convert the answers back to decimal and

verify that they are correct.

**1.21** If the numbers (+9,742) 10 and (+641) 10 are in signed magnitude format, their sum is (+10,383)10 and requires five digits and a sign. Convert the numbers to signed-10’s‐complement form and find the following sums:

(a) (+9,742) + (+641) (c) (-9,742) + (+641) (d) (-9,742) + (-641)

**1.22** Convert decimal 6,514 to both BCD and ASCII codes. For ASCII, an even parity bit is to

be appended at the left.

**1.24** Formulate a weighted binary code for the decimal digits, using the following weights:

(b) 6, 4, 2, 1

**1.25** Represent the decimal number 6,248 in (a) BCD, (b) excess‐3 code, (c) 2421 code, and

(d) a 6311 code.

**1.26** Find the 9’s complement of decimal 6,248 and express it in 2421 code. Show that the result is the 1’s complement of the answer to (c) in CR\_PROBlem 1.25. This demonstrates that

the 2421 code is self‐complementing.

**1.33\*** The state of a 12‐bit register is 100010010111. What is its content if it represents

(a) Three decimal digits in BCD?

(b) Three decimal digits in the excess‐3 code?

(c) Three decimal digits in the 84‐2‐1 code?

(d) A binary number?

**1.34** List the ASCII code for the 10 decimal digits with an even parity bit in the leftmost position.