

$$\begin{array}{r}
 101 \overline{) 1111} \\
 \underline{-101} \downarrow \\
 0101
 \end{array}$$

$$11010101$$

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Assignment - 1

1. Perform the following binary additions:

(a) $1001 + 1110$ (b) $10111 + 11101$

2. Perform the following binary subtractions:

(a) $1101 - 0101$ (b) $1011 - 0101$

3. Perform the indicated binary operations:

(a) 1110×101 (b) $1111 / 101 \rightarrow 1$

4. Express each decimal number in binary as an 8-bit sign-magnitude number:

(a) -85 (b) +100 (c) -113

5. Express each decimal number as an 8-bit number in the 1's complement form:

(a) -65 (b) +126 (c) -98

6. Express each decimal number as an 8-bit number in the 2's complement form:

(a) -58 (b) +112 (c) -136

7. Determine the decimal value of each signed binary number in the sign-magnitude form:

(a) 10011101 (b) 01110100 (c) 10111011

-29

+116

-59

8. Determine the decimal value of each signed binary number in the 1's complement form:

(a) 10111001 (b) 01100100 (c) 10111101

9. Determine the decimal value of each signed binary number in the 2's complement form:

(a) 10111011 (b) 01010100 (c) 10011000

10. What is the largest decimal number that can be represented in binary with eight bits?

11. Determine the weight of the 1 in the binary number 10000.

12. Convert each pair of decimal numbers to binary and add using the 2's complement form (8-bit representation):

(a) -38 and -27 (b) 59 and -39 (c) -58 and 65 (d) -102 and -85

(e) 29 and -72 (f) 111 and -49

13. Convert each hexadecimal number to binary:

(a) 48A6 (b) F4C6 (c) B426 (d) 1A3D6

14. Convert each binary number to hexadecimal:

(a) 11110110 (b) 10101011 (c) 101110011011 (d) 10101101010 (e) 101011101100

15. Convert each hexadecimal number to decimal:

(a) 4226 (b) 6426 (c) 2B26 (d) ABC26 (e) 6F226

16. Convert each decimal number to hexadecimal:

(a) 3654 (b) 7824 (c) 8926 (d) 551 (e) 3682

$$\begin{array}{r}
 85 \\
 42 \\
 \hline
 127
 \end{array}$$

$$\begin{array}{r}
 010 \\
 01 \\
 \hline
 0101
 \end{array}$$

17. Convert each of the following decimal numbers to BCD (8421):
(a) 4124 (b) 6139 (c) 918 (d) 2341 (e) 225 (f) 36455
18. Convert each of the BCD numbers to decimal:
(a) 1000110000 (b) 0010010110111 (c) 0011101000110 (d) 01001100100001
(e) 011101010100 (f) 1000000000000 (g) 100101111000 (h) 0001011010000011
19. Determine which of the following even parity codes are in error:
(a) 100110010 (b) 011101010 (c) 10111111010001010
20. Determine which of the following odd parity codes are in error:
(a) 11110110 (b) 00110001 (c) 01010101010101010
21. Attach the proper even parity bit to each of the following bytes of data:
(a) 10100100 (b) 00001001 (c) 11111110
22. Convert each binary number to Gray code:
11011 (b) 1001010 (c) 1111011101110
23. Convert each Gray code to binary:
(a) 1010 (b) 00010 (c) 11000010001
24. Add the following BCD numbers:
(a) 1001 + 0110 (b) 0011 + 1001
(c) 1001 + 1001 (d) 1001 + 0111
(e) 00110101 + 01100111
(f) 01010011 + 01011000
(g) 10010101 + 10010111
(h) 010101100011 + 001100101000