**Assignment – 1**

1. Perform the following binary additions:

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

1. Perform the following binary subtractions:

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

1. Perform the indicated binary operations:

(a) 1110 x 101 (b) 1111 / 101

1. Express each decimal number in binary as an 8-bit sign-magnitude number:
2. -85 (b) +100 (c) -113
3. Express each decimal number as an 8-bit number in the 1’s complement form:
4. - 65 (b) +126 (c) -98
5. Express each decimal number as an 8-bit number in the 2’s complement form:
6. -58 (b) +112 (c) -136
7. Determine the decimal value of each signed binary number in the sign-magnitude form:
8. 10011101 (b) 01110100 (c) 10111011
9. Determine the decimal value of each signed binary number in the 1’s complement form:
10. 10111001 (b) 01100100 (c) 10111101
11. Determine the decimal value of each signed binary number in the 2’s complement form:

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

1. What is the largest decimal number that can be represented in binary with eight bits?
2. Determine the weight of the 1 in the binary number 10000.
3. Convert each pair of decimal numbers to binary and add using the 2’s complement form(8bit 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

1. Convert each hexadecimal number to binary:
2. 48A6 (b) F4C6 (c) B426 (d) 1A3D6
3. Convert each binary number to hexadecimal:
4. 11110110 (b) 10101011 (c) 101110011011 (d) 10101101010 (e) 101011101100
5. Convert each hexadecimal number to decimal:
6. 4226 (b) 6426 (c) 2B26 (d) ABC26 (e) 6F226
7. Convert each decimal number to hexadecimal:
8. 3654 (b) 7824 (c) 8926 (d) 551 (e) 3682
9. Convert each of the following decimal numbers to BCD (8421):
10. 4124 (b) 6139 (c) 918 (d) 2341 (e) 225 (f) 36455
11. Convert each of the BCD numbers to decimal:

(a) 1000110000 (b) 0010010110111 (c) 0011101000110 (d) 01001100100001

(e) 011101010100 (f) 100000000000 (g) 100101111000 (h) 0001011010000011

1. Determine which of the following even parity codes are in error:
2. 100110010 (b) 011101010 (c) 10111111010001010
3. Determine which of the following odd parity codes are in error:
4. 11110110 (b) 00110001 (c) 01010101010101010
5. Attach the proper even parity bit to each of the following bytes of data:

(a) 10100100 (b) 00001001 (c) 11111110

1. Convert each binary number to Gray code:

11011 (b) 1001010 (c) 1111011101110

1. Convert each Gray code to binary:
2. 1010 (b) 00010 (c) 11000010001
3. 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