

EE1001 Part 2 - Tutorial 2 -Answer

1. Find the 9's, 10's, 1's (8-bit) and 2's (8-bit) complement of decimal numbers: 27 and 73.

Ans.

	9's	10's	1's	2's
27	72	73	1110 0100	1110 0101
73	26	27	1011 0110	1011 0111

2. Find the decimal value of the following 8-bit 2's complement numbers:

(a) 10011000, (b) 00011101, (c) 11111010, (d) 01100101

Ans. (a) -104 (b) 29 (c) -6 (d) 101

3. Express the following decimal numbers in 6-bit 2's complement representation:

(a) -16, (b) 13, (c) -3, (d) -10, (e) 26, (f) -42

Ans. (a) 110000 (b) 001101 (c) 111101 (d) 110110 (e) 011010 (f) out range

4. Convert decimal numbers 104 and 45 to 8-bit unsigned binary number and find the sum and check for its correctness.

Ans. $104_{10} = 0110\ 1000$, $45_{10} = 0010\ 1101$

Sum = 1001 0101 (No carry – correct)

5. Convert decimal numbers 104 and -45 to 8-bit 2's complement number and find the sum and check for its correctness.

Ans. $104_{10} = 0110\ 1000$, $-45_{10} = 1101\ 0011$

sum = 0011 1011 (No overflow – correct)

6. Represent the following decimal numbers in 8-bit 2's complement numbers and use addition to perform the following arithmetic operation, and check for the correctness of the answers:

(a) 44+45, (b) 104+32, (c) -39+92, (d) -17-63, (e) -103-69

Ans. (a) 0101 1001 (b) overflow (c) 0011 0101 (d) 1011 0000 (e) overflow

7. Express two BCD numbers 585 and 367 in binary format and perform binary addition. Find the sum and express the result in BCD format.

Ans. $952_{BCD} = 1001\ 0101\ 0010$ (add 0110 to digits with sum greater than 9)

8. Express two decimal numbers 13 and 11 in 4-bit unsigned binary number and perform binary multiplication to find the product.

Ans. $1101 \times 1011 = 1000\ 1111$

9. Find the quotient and remainder for $101110010 \div 1001$.

Ans. Quotient = 101001, remainder = 1

10. Find the result of $101110010 \div 1001$ with 6 fractional digits.

Ans. = 101001.000111