Binary Numbers Tutorial Sheet B

1. Perform the following binary additions.

   a) $(110101)_2 + (1010111)_2$
   b) $(1010101)_2 + (101010)_2$
   c) $(11001010)_2 + (10110101)_2$
   d) $(1011001)_2 + (111010)_2$

2. Perform the following binary divisions.

   a) $(1001000)_2 \div (1000)_2$
   b) $(101101)_2 \div (1001)_2$
   c) $(1001011000)_2 \div (101000)_2$
   d) $(1100000)_2 \div (10000)_2$

3. Binary Substraction

   (i) 110 - 10
   (ii) 101 - 11
   (iii) 1001 - 11
   (iv) 10001 - 100
   (v) 101001 - 1101
   (vi) 11010101-1101

4. Perform the binary subtractions using both the bit-borrowing method and the two's complement method.

   (a) $(1001)_2 - (111)_2$
   (b) $(110000)_2 - (10111)_2$

5. Perform the following binary additions.

   a) $(110101)_2 + (1010111)_2$
   b) $(1010101)_2 + (101010)_2$
   c) $(11001010)_2 + (10110101)_2$
   d) $(1011001)_2 + (111010)_2$

6. Perform the following binary multiplications.

   a) $(1001)_2 \times (1000)_2$
   b) $(101)_2 \times (1101)_2$
   c) $(111)_2 \times (1111)_2$
   d) $(10000)_2 \times (11001)_2$

7. Perform the following binary multiplications.

   a) $(1001000)_2 \div (1000)_2$
   b) $(101101)_2 \div (1001)_2$
   c) $(1001011000)_2 \div (101000)_2$
   d) $(1100000)_2 \div (10000)_2$

8. Perform the following binary division exercises.

   a) $(1001000)_2 \div (1000)_2$
   b) $(101101)_2 \div (1001)_2$
   c) $(1001011000)_2 \div (101000)_2$
   d) $(1100000)_2 \div (10000)_2$