



EC1001: Digital Circuits

Assignment-1_Chapter1

1. What is the exact number of bytes in a system that contains (a) 16K bytes, (b) 32M bytes, and (c) 2G bytes?
2. What is the largest binary number that can be expressed with 16 bits? What are the equivalent decimal, octal and hexadecimal numbers?
3. Convert the decimal number 253 to binary in two ways: (a) convert directly to binary; (b) convert first to hexadecimal and then from hexadecimal to binary. Which method is faster?
4. Convert the following binary numbers to hexadecimal and to decimal: (a) 1.00011, (b) 1000.11. Explain why the decimal answer in (b) is 8 times that in (a).
5. (a) Find the 16's complement of CAD9.
(b) Convert CAD9 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).
6. If the numbers $(+9,081)_{10}$ and $(+954)_{10}$ are in signed magnitude format, their sum is $(+10,035)_{10}$ and requires five digits and a sign. Convert the numbers to signed-10's complement form and find the following sums:
(a) $(+9,081) + (+954)$ (b) $(+9,081) + (-954)$
(c) $(-9,081) + (+954)$ (d) $(-9,081) + (-954)$
7. 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.
8. Represent the unsigned decimal numbers 609 and 516 in BCD, and then show the steps necessary to form their sum.
9. Assign a binary code in some orderly manner to the 52 playing cards. Use the minimum number of bits.
10. The state of a 12-bit register is 010101100100. 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 8-4-2-1 code?
(d) A decimal number?