

Computer Number Systems Worksheet
Created by Sam Craig and the West Lafayette ACSL Club of 2014–2015

A subscript after a number designates what base it is in. For example, 20_{10} is 20 in base ten, but usually base ten is assumed and left out. 10_{16} is 10 in base 16, or 16 in base ten. A **bit** is a **binary** digit.

Questions

1. Convert 5250_{10} to hexadecimal.
2. Convert 2036_{10} to binary.
3. Convert $15F_{16}$ to octal.
4. Convert 101000100011_2 to hexadecimal.
5. Evaluate $21A7_{16} - 110_{16}$ in hexadecimal.
6. Evaluate $10531_8 + 12414_8$ in octal.
7. Evaluate $1101111_2 - 111011_2$ in binary.
8. Evaluate $3C0_{16} + 340_8$ in hexadecimal.
9. In the ACSL computer, each “word” of memory contains 20 bits representing 3 pieces of information. The most significant 6 bits represent Field A; the next 11 bits, Field B; and the last 3 bits represent Field C. For example, the 20 bits comprising the “word” 18149_{16} has fields with values of 6_{16} , 29_{16} , and 1_{16} . What is Field B in $E1B7D_{16}$? (Express your answer as a base 16 number.)

Answers

1. 1482_{16}
2. 11111110100_2
3. 537_8
4. $A23_{16}$
5. 2097_{16}
6. 23145_8
7. 110100_2
8. 2240_8
9. $36F_{16}$