

Basic Concepts – Worksheet

True-False

Please indicate whether each statement is True (T) or False (F).

1. The binary representation of decimal 42 is 00101010.
2. The hexadecimal representation of decimal 35 is 33h
3. The sum of the binary integers 01101101 and 00111011 is 10101001.
4. The 8-bit two's complement of binary 00000010 is 11111110.
5. The binary representation of decimal -42 is 11010111.
6. Suppose there is a virtual machine containing levels V1 and V2, where V2 is above V1 in the machine hierarchy. The programs written in language V2 can be executed by a program running at level V1.
7. The sum of all powers of 2 from 2^0 to 2^8 is 511.
8. A virtual machine may be constructed from software.
9. The sum of 3AB4h and 0429h is 3EDDh.
10. To translate an unsigned decimal integer into binary, repeatedly divide the integer by 2, saving each remainder as a binary digit.
11. The expression $\neg X \wedge \neg Y$ is false when X is false and Y is true.

Short Answers

1. What are the hexadecimal and decimal representations of the ASCII character capital B?
2. What are the hexadecimal and decimal representations of the ASCII character capital G?
3. The following 16-bit hexadecimal numbers represent signed integers. Convert each to decimal:
 - a. 6BF9
 - b. C123
4. What is the hexadecimal representation of each of the following binary numbers?
 - a. 0011 0101 1101 1010
 - b. 1100 1110 1010 0011
 - c. 1111 1110 1101 1011