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Assignment 4

Binary Integer Questions

1. How would you represent the number 6 as a binary number:   
00000110  
2. How would you represent the number 73 as a binary number:   
01001001  
3a. Perform the following binary arithmetic:   
00000110  
01001001 +  
01001111  
3b. Perform the following binary arithmetic:   
00000110  
01001011 +  
01010101  
4. What is the name of the condition that occurs when performing the following binary arithmetic:   
11001001  
01100010 +  
Overflow  
5. How would you represent the number -71 using 'Sign and Magnitude' and assuming 8 bits.  
11000111  
6. What is the largest number that you can represent using 'Sign and Magnitude' and assuming 8 bits. Express your answer as a denary number.  
127  
7. How would you represent the number -71 using 'One's Compliment' and assuming 8 bits.  
10111000

8. What is the most negative number that you can represent using 'One's Compliment' and assuming 8 bits. Express your answer as a denary number.  
-127  
9. What is the largest number that you can represent using 'Two's Compliment' and assuming 8 bits. Express your answer as a denary number.  
127  
10. What is the most negative number that you can represent using 'Two's Compliment' and assuming 8 bits. Express your answer as a denary number.  
-128  
11. What is the denary value of the following binary number: 11010111, given that the number is represented in binary using 'Two's Compliment'.  
-41  
12. How would the denary number -10 be represented in binary using 'Two's Compliment' and assuming 8 bits.  
11110110  
13. What is the denary result of the following sum given that the numbers shown are represented in binary using 'Two's Compliment' and assuming 8 bits.  
00000110  
10010000  
-106

Floating Point Questions

14a. Given an 8 bit floating point representation with 5 bits for the fraction part and 3 bits for the exponent part, what is the largest number that can be stored?  
124  
14b. Given the same representation, what is the next closest number (to your answer for 14a) that can be represented?  
120  
15. Given an 8 bit floating point representation with 4 bits for the fraction part and 4 bits for the exponent part, what is the largest number that can be stored?  
30720  
15b. Given the same representation, what is the next closest number (to your answer for 15a) that can be represented?  
28672

Hex/Octal Questions

16. What is the denary value of the hex number FFF:  
4095  
17. How would you express the positive binary integer 01101100 in hexadecimal?  
6C

18. What is the binary representation of the Octal number 62?  
00110010