

1. Under what circumstances will the addition of two binary numbers in 2's complement representation, one of which is negative and one positive, result in an invalid result?
 - a. if the result appears negative.
 - b. if the result appears positive.
 - c. **never.**
 - d. always.
 - e. none of the above.
2. What procedure is required to add the two 2's complement numbers 0110 1101 and 110?
 - a. take the 2's complement of the smaller number and extend it.
 - b. take the 2's complement of the negative number.
 - c. pad the shorter number with 0's.
 - d. **sign extend the shorter number.**
 - e. shift the shorter number to the left by 5 places.
3. Using two's complement encoding, subtract 1 1100 from 0 1101, and report the result as a 5-bit two's complement binary number
 - a. 101001
 - b. 01001
 - c. 00100
 - d. **10001**
 - e. 10101
 - f. 00101
4. Convert the 8-bit two's complement number 1000 1111 into decimal
 - a. -15
 - b. -241
 - c. **-113**
 - d. +143
 - e. -143
 - f. +112
5. Convert the decimal 3,297 to unsigned magnitude binary (using the minimum possible number of bits)
 - a. 1001 1101 0101
 - b. 0111 0101 0111
 - c. **1100 1110 0001**
 - d. 0 1100 1110 0001
 - e. 0 1011 1011 0011
 - f. 111 0101 1101
6. Convert the number -41 into two's complement binary representation:
 - a. 010 1001
 - b. 01 1001
 - c. 10 0111
 - d. **101 0111**
 - e. 110 1001
 - f. 101 1001

The next three questions refer to the decimal number 27.375

7. What is the fixed point representation of this number in the "hybrid" binary system using the "binary point"?
 - a. 11101.111
 - b. 11011.111
 - c. 11101.101
 - d. 11011.101
 - e. 11101.011
 - f. **11011.011**
8. What is the **normalized mantissa** or fractional part of this binary number that will be used to build the IEEE-754 floating point representation of the original number?
 - a. 011101
 - b. **1011011**
 - c. 11101011
 - d. 11101111
 - e. 11101101
 - f. 1011111

9. What is the **biased exponent** that will be used to build the IEEE-754 floating point representation of the original number (in decimal representation)?

- a. 5
- b. 4

- c. 132
- d. **131**

- e. -122
- f. -123

10. What is the decimal equivalent of the IEEE-754 floating point number

1 10000011 000100000000000000000000

- a. **-17.0**
- b. -8.5

- c. -4.25
- d. -2.125

- e. -1.06125