# Tests & Quizzes

# Assignment 2

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## Part 1 of 8 / 1.0 Points

Question 1 of 9 1.0 Points

Click to see additional instructions

What is the binary equivalent (in signed-magnitude binary representation) of the following **signed** *decimal* value?

***Represent the integer part of the binary value, including the sign, in 8 bits.***

***Represent the fraction part of the binary value in 4 digits. Use truncation, if needed.***

-103.5625 ✔ 11100111.1001

**Answer Key:** 11100111.1001

## Part 2 of 8 / 1.0 Points

Question 2 of 9 1.0 Points

Click to see additional instructions

What is the signed decimal equivalent of the following ***signed-magnitude*** *binary* value?

11101010.1001 ✔ -106.5625

**Answer Key:** -106.5625

## Part 3 of 8 / 2.0 Points

Question 3 of 9 2.0 Points

Click to see additional instructions

What is the binary equivalent (in two's complement binary representation) of the following ***signed*** *decimal* value?

***Represent the integer part of the binary value, including the sign, in 8 bits.***

***Represent the fraction part of the binary value in 4 digits. Use truncation, if needed.***

-55.6875 ✔ 11001000.0101

**Answer Key:** 11001000.0101

## Part 4 of 8 / 2.0 Points

Question 4 of 9 2.0 Points

Click to see additional instructions

What is the signed decimal equivalent of the following ***two's complement*** *binary* value?

11011001.0011 ✔ -38.8125

**Answer Key:** -38.8125

## Part 5 of 8 / 4.0 Points

**In this question, you are provided with two *unsigned* binary numbers, A and B.**

**You are asked to evaluate (-A - B) as well as (-A + B) using the *two's complement 12-bit number system*.**

**If the result is encoded in less than 12 bits (including the sign bit), you need to extend it to fill the entire 12 bits.**
**If your answer is less than 12 bits or more than 12 bits, you will get zero.**

**Indicate if an overflow occurred or not.**

**N.B.: You need to provide the entire 12-bit result, even if an overflow occurs.**

***You MUST report the answer in 2's complement.***

**Do *NOT* convert the number back from the 2's complement.**
**Leave it in the 2's complement representation.**

Question 5 of 9 2.0 Points

When A = 10011110001 and B = 11110010,

the value of (-A - B) = ✔ 101000011101 , If an overflow occurred during evaluating this expression, type yes, if not type no ✔ no ; and

the value of (-A + B) = ✔ 110000000001 , If an overflow occurred during evaluating this expression, type yes, if not type no ✔ no

**Answer Key:** 101000011101, N|NO|No|no, 110000000001, N|NO|No|no

Question 6 of 9 2.0 Points

When A = 10010111010 and B = 10010010011,

the value of (-A - B) = ✔ 011010110011 , If an overflow occurred during evaluating this expression, type yes, if not type no ✔ yes ; and

the value of (-A + B) = ✔ 111111011001 , If an overflow occurred during evaluating this expression, type yes, if not type no ✔ no

**Answer Key:** 011010110011, Y|Yes|yes|YES, 111111011001, N|NO|No|no

## Part 6 of 8 / 2.0 Points

**In this question, you are provided with an *unsigned* binary number.**

**You are asked to *round* this number to 4 binary digits *after* the radix point using various rounding methods.**

**Your answer *MUST* consist of:**

- **4 digits for the fraction part (after rounding),**
- **1 radix point, and**
- **3 digits for the integer part.**

**If you have any more or fewer symbols or spaces, you will get *zero* for this question.**

Question 7 of 9 2.0 Points

Truncation( 100.10110101) = ✔ 100.1011 ;

Rounding-towards-zero(100.10110101) = ✔ 100.1011 ;

Rounding-towards-positive-infinity(100.10110101) = ✖ 100.1011 ;

Rounding-to-nearest(100.10110101) = ✔ 100.1011

**Answer Key:** 100.1011, 100.1011, 100.1100, 100.1011

## Part 7 of 8 / 4.0 Points

**In this question, you are provided with a *decimal floating-point number*.**

**You are asked to encode this value into its *IEEE-754 floating-point representation* in the form of 8 hexadecimal digits.**

***If rounding is needed, use rounding to the nearest floating-point number.***

***Do NOT add any spaces or commas to your answer.***

Question 8 of 9 4.0 Points

Represent, i.e., encode, 262272.078125 into a 32-bit single-precision IEEE-754 FP value.

If rounding is needed, use rounding to the nearest FP number.

**Your answer MUST BE JUST 8 hexadecimal digits.**

**Write each hexadecimal digit in a field by itself.**

0x ✔ 4 ✔ 8 ✔ 8 ✔ 0 ✔ 1 ✔ 0 ✔ 0 ✔ 2

**Answer Key:** 4, 8, 8, 0, 1, 0, 0, 2

## Part 8 of 8 / 4.0 Points

**In this question, you are provided with an *IEEE-754 floating-point number* in the form of 8 hexadecimal digits.**

**You are asked to decode this value into its decimal representation.**

***Do NOT use scientific notation.***

***Do NOT round or truncate your answer.***

***Do NOT add any spaces or commas to your answer.***

***If the converted number is positive, do NOT add the plus sign.***

***Your answer will consist of two parts, the integer value and the fraction value.***

***Do not add any insignificant zeros to your answer.***
***For the fraction part, you can start it by a decimal point or by a single 0, followed by a decimal point.***

Question 9 of 9 4.0 Points

Convert, i.e., decode, 0x48804002 from the 32-bit single-precision IEEE-754 FP representation into decimal representation.

The integer part of the number is: ✔ 262656

The fractional part of the number (including the decimal point) is: ✔ .0625

**Answer Key:** 262656, .0625|0.0625