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on Binary Fractions

Instructions: For each question, choose the single best answer. Make your choice by clicking on its button. You can change your answers at any time. When the quiz is graded, the correct answers will appear in the box after each question.

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1. In the **decimal** fraction 12.345 what power of 10 is the digit 5 associated with?

- (•) **A.** -3
- ( ) **B.** -2
- ( ) **C.** -1
- ( ) **D.** 1

A

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2. In the **binary** fraction 10.001 what power of 2 is the rightmost bit associated with?

- (•) **A.** -3
- ( ) **B.** -2
- ( ) **C.** 1
- ( ) **D.** -1

A

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3. Express `1 + 4/10 + 3/100` using base 10 positional notation.

- ( ) **A.** 1.043
- ( ) **B.** 143.00
- (•) **C.** 1.43
- ( ) **D.** 0.143

C

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4. Express `1 + 1/2 + 0/4+ 1/8` using base 2 positional notation.

- ( ) **A.** 1.11
- ( ) **B.** 1.011

- ○ **C.** 11.1
- ◉ **D.** 1.101

D

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5. What is 2^{-1} ? (Express the answer in base 10)

- ◉ **A.** 1/2
- ○ **B.** 1/4
- ○ **C.** 1/8
- ○ **D.** 2

A

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6. Write 1.01_2 as a base 10 expression.

- ○ **A.** 1.125
- ◉ **B.** 1.25
- ○ **C.** 1.5
- ○ **D.** 1.625

B

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7. Say that the following is a four bit binary fixed-point expression and that the point is fixed between the middle two bits.

1011

What value does it represent? (Write the answer in decimal.)

- ○ **A.** 10.75
- ○ **B.** 2.3
- ◉ **C.** 2.75
- ○ **D.** 1.625

C

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8. Here is another four bit binary fixed-point expression with the point is fixed between the middle two bits.

0001

What value does it represent? (Write the answer in decimal.)

- ○ **A.** 1.25
- ○ **B.** 2.2
- ○ **C.** 1.625

- (●) **D.** 0.25

D

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9. Perform the following addition of fixed-point binary operands using the Binary Addition Algorithm. Assume that the binary point is in the middle. What value does the sum represent?

```
1011
0001
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```

- ( ) **A.** 1100 represents 12_{10}
- ( ) **B.** 0110 represents 1.5_{10}
- ( ) **C.** 1100 represents 3.5_{10}
- (●) **D.** 1100 represents 3_{10}

D

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10. A method that uses only four bits can represent only 16 values. This is described as a limit on its _____.

- ( ) **A.** Accuracy
- (●) **B.** Precision
- ( ) **C.** Magnitude
- ( ) **D.** Resolution

B

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11. Which one of the following statments is true?

- ( ) **A.** Computer arithmetic is so precise that if the input values are correct, all calculations will be accurate.
- ( ) **B.** Computer arithmetic is always much more precise than an ordinary electronic calculator.
- (●) **C.** Even when using double precision floating point it is easy for errors in a calculation to accumulate until the result is meaningless.
- ( ) **D.** Sixtyfour bits of precision is more than anyone could ever want.

C

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12. The number 0.625 is here represented as a decimal fraction. Multiply it by two. Copy the one's place digit of the result to the beginning of a binary fraction. What is the beginning the binary fraction that represents the number?

- (●) **A.** 0.1
- ( ) **B.** 0.0

- **C.** 1.1
- **D.** 2.0

A

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13. After multiplying the number by two and dropping the digit to the right of the decimal point you are left with 0.25. Multiply this by two and copy the one's place digit of the result to the binary fraction. What is the binary fraction so far?

- **A.** 0.11
- **B.** 0.10
- **C.** 1.01
- **D.** 0.01

B

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14. The number you are working on now looks like: 0.5. Repeat the above process to complete the binary fraction. The number 0.625 represented as a binary fraction is:

- **A.** 0.111
- **B.** 1.011
- **C.** 0.110
- **D.** 0.101

D

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15. Represent the decimal fraction 0.375 as a binary fraction.

- **A.** 0.11
- **B.** 0.111
- **C.** 0.011
- **D.** 0.001

C

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16. Which of the following binary fractions is an approximation to the decimal fraction 0.8?

- **A.** 0.11001
- **B.** 0.10101
- **C.** 0.11010
- **D.** 0.0111

A

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17. If you know how many times a loop should execute, the loop control variable should be:

- **A.** float

- **B.** double
- **C.** boolean
- **D.** int

D

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18. Say that you have a `while` loop that uses a conditional expression that involves floating point variables. Which one of the following comparison operators should **not** be used in the conditional expression?

- **A.** ==
- **B.** >
- **C.** <
- **D.** <=

A

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19. Which one of the following decimal fractions cannot be represented accurately using a binary fraction?

- **A.** 0.5
- **B.** 0.0
- **C.** 0.1
- **D.** 0.125

C

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20. Most programs that do floating point calculations should use variables of what type?

- **A.** double
- **B.** float
- **C.** single
- **D.** real

A

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grade quiz The number you got right: 20 Percent Correct: 100 Letter Grade: A

If you have returned here from another page, or have re-loaded this page, you will need to click again on each of your choices for the grading program to work correctly. You may want to press the SHIFT KEY while clicking to clear the old answers.