МИНИСТЕРСТВО ЦИФРОВОГО РАЗВИТИЯ, СВЯЗИ И МАССОВЫХ КОММУНИКАЦИЙ РОССИЙСКОЙ ФЕДЕРАЦИИ

Ордена Трудового Красного Знамени федеральное государственное бюджетное образовательное учреждение высшего образования

**«Московский технический университет связи и информатики»**

Кафедра «Информатика»

ОТЧЕТ

**по дисциплине**

**«Введение в информационные технологии. Информатика»**

ПРАКТИЧЕСКАЯ РАБОТА №2

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Вариант №26

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Москва, 2022 г.

Ход работы:

1. Выполнение задания №1:
2. Представим число 97 в двоичном виде:

9710 = 64 + 32 + 1 = 11000012

1. Составим прямой код двоичного числа:

01100001

1. Составим обратный код двоичного числа:

01100001

1. Составим дополнительный код двоичного числа:

01100001

1. Представим число -46 в двоичном виде:

-4610 = 32 + 8 + 4 + 2 = -1011102

1. Составим прямой код двоичного числа:

10101110

1. Составим обратный код двоичного числа:

11010001

1. Составим дополнительный код двоичного числа:

11010010

1. Сложим два дополнительных кода:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| + | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |
| 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |

1. Переведем полученное число в десятичный вид, отбросив 9 цифру (справа налево):

001100112 = 32 + 16 + 2 + 1 = 5110

1. Произведем проверку в десятичном виде:
2. – 46 = 51
3. Выполнение задания №2:
4. Представим число 121 в двоичном виде:

12110 = 64 + 32 + 16 + 8 + 1 = 11110012

1. Представим число 38 в двоичном виде:

3810 = 32 + 4 + 2 = 1001102

1. Перемножим в столбик два числа в десятичном виде:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| x |  |  |  |  |  |  | 1 | 1 | 1 | 1 | 0 | 0 | 1 |
|  |  |  |  |  |  |  | 1 | 0 | 0 | 1 | 1 | 0 |
|  |  |  |  |  | 1 | 1 | 1 | 1 | 0 | 0 | 1 |  |
|  |  |  |  | 1 | 1 | 1 | 1 | 0 | 0 | 1 |  |  |
|  | 1 | 1 | 1 | 1 | 0 | 0 | 1 |  |  |  |  |  |
|  | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 |

1. Переведем полученное число в десятичный вид:

10001111101102 = 4096 + 256 + 128 + 64 + 32 + 16 + 4 + 2 = 459810

1. Проведем проверку в десятичном виде:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| x |  |  | 1 | 2 | 1 |
|  |  |  | 3 | 8 |
| + |  |  | 9 | 6 | 8 |
|  | 3 | 6 | 3 |  |
|  |  | 4 | 5 | 9 | 8 |

1. Выполнение задания №3:
2. Переведем число 5814 в двоичный вид:

581410 =4096 + 1024 + 512 + 128 + 32 + 16 + 4 + 2= 10110101101102

1. Переведем число 57 в двоичный вид:

5710 = 32 + 16 + 8 + 1 = 1110012

1. Произведем деление двоичных чисел в столбик:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| - | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 |
|  | 1 | 1 | 1 | 0 | 0 | 1 |  |  |  |  |  |  | 1 | 1 | 0 | 0 | 1 | 1 | 0 |
|  | - | 1 | 0 | 0 | 0 | 0 | 1 | 1 |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  | 1 | 1 | 1 | 0 | 0 | 1 |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  | - | 1 | 0 | 1 | 0 | 1 | 0 | 1 |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  | 1 | 1 | 1 | 0 | 0 | 1 |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  | - | 1 | 1 | 1 | 0 | 0 | 1 |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  | 1 | 1 | 1 | 0 | 0 | 1 |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  | 0 | 0 | 0 |  |  |  |  |  |  |

1. Переведем число в десятичный вид:

11001102 = 64 + 32 + 4 + 2 = 10210

1. Произведем проверку в десятичном виде:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| - | 5 | 8 | 1 | 4 | 5 | 7 |
| 5 | 7 |  |  | 1 | 0 | 2 |
|  | - | 1 | 1 | 4 |  |  |  |
|  | 1 | 1 | 4 |  |  |  |
|  |  |  |  | 0 |  |  |  |

1. Выполнение задания №4:
2. Переведем число 697,1875 в двоичный вид:

69710 = 512 + 128 + 32 + 16 + 8 + 1 = 10101110012

|  |  |
| --- | --- |
| **0** | 1875 |
| **.** | 2 |
| **0** | 375 |
|  | 2 |
| **0** | 75 |
|  | 2 |
| **1** | 5 |
|  | 2 |
| **1** | 0 |

697,187510 = 1010111001,00112

1. Запишем двоичное число в нормализованном виде:

(-1)0 \* 1,0101110010011 \* 10­­­1001

3) Запишем число в виде мантиссы:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

1. Переведем число 14,375 в двоичный вид:

1410 =8 + 4 + 2 = 11102

|  |  |
| --- | --- |
| **0** | 375 |
| **.** | 2 |
| **0** | 75 |
|  | 2 |
| **1** | 5 |
|  | 2 |
| **1** | 0 |
|  |  |

14,37510 = 1110,0112

1. Представим двоичное число в нормализованном виде:

(-1)0 \* 1,110011 \* 1011­

5) Запишем число в виде мантиссы:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

6) Мантиссу с меньшим порядком преобразуем, чтобы порядки совпадали:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

7) Сложим получившиеся Мантиссы (кроме порядка и знака числа):

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

+

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

=

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

8) Запишем число в нормализованном виде:

(-1)­0 \* 1,0110001111001 \* 101001

9) Сделаем проверку в десятичном виде:

697,1875 + 14,375 = 711,5625

10) Переведем число 711,5625 в двоичную систему исчисления:

71110 = 512 + 128 + 64 + 4 + 2 + 1 = 10110001112

|  |  |
| --- | --- |
| **0** | .5625 |
| **.** | 2 |
| **1** | 125 |
|  | 2 |
| **0** | 25 |
|  | 2 |
| **0** | 5 |
|  | 2 |
| **1** | 0 |

711,562510 = 1011000111,10012

11) Представим число в нормализованном виде и убедимся в правильности выполнения задания:

(-1)0 \* 1,0110001111001 \* 101001

1. Найдем разницу двух Мантисс, по аналогии с суммой:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

-

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

=

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

1. Представим число в нормализованном виде:

(-1)0 \* 1,0101010101101 \* 101001

1. Сделаем проверку в десятичном виде:

697,1875 – 14,375 = 682,8125

1. Переведем число 682,8125 в двоичный вид:

68210 = 512 + 128 + 32 + 8 + 2 = 10101010102

|  |  |
| --- | --- |
| **0** | 8125 |
| **.** | 2 |
| **1** | 625 |
|  | 2 |
| **1** | 25 |
|  | 2 |
| **0** | 5 |
|  | 2 |
| **1** | 0 |

682,812510 = 1010101010,11012

1. Запишем число в нормализованном виде и убедимся в правильности решения:

(-1)0 \* 1,0101010101101 \* 101001

1. Выполнение задания №5:
2. Запишем в двоичном виде число 64,5:

6410 = 10000002

|  |  |
| --- | --- |
| **0** | 5 |
| **.** | 2 |
| **1** | 0 |

64,510 = 1000000,12

1. Представим число в нормализованном виде:

(-1)0 \* 1,0000001 \* 10110

1. Составим Мантиссу числа:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

1. Запишем число 10,375 в двоичном виде:

1010 = 8 + 2 = 10102

|  |  |
| --- | --- |
| **0** | 375 |
| **.** | 2 |
| **0** | 75 |
|  | 2 |
| **1** | 5 |
|  | 2 |
| **1** | 0 |

10,37510  = 1010,0112

1. Представим число в нормализованном виде:

(-1)­0 \* 1,010011 \* 1011

1. Составим Мантиссу числа:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

1. Перемножим Мантиссы, а порядки складываем и вычитаем смещение (1111111) (кроме порядка и знака числа)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**- x**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

=

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

1. Представим ответ в нормализованном виде:

(-1) 0 \* 1.0100111010011 \* 101001

1. Проведем проверку в десятичном виде:

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| x |  |  |  |  |  |  | 6 | 4 | . | 5 | 0 | 0 |
|  |  |  |  |  |  | 1 | 0 | . | 3 | 7 | 5 |
| + |  |  |  |  |  |  | 3 | 2 | 2 | 5 |  |  |
|  |  |  |  |  | 4 | 5 | 1 | 5 |  |  |  |
|  |  |  |  | 1 | 9 | 3 | 5 |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | 6 | 4 | 5 |  |  |  |  |  |  |
|  |  |  |  | 6 | 6 | 9. | 1 | 8 | 7 | 5 |  |  |

66910 = 512 + 128 + 16 + 8 + 4 + 1 = 10100111012

|  |  |
| --- | --- |
| **0** | .1875 |
| **.** | 2 |
| **0** | 375 |
|  | 2 |
| **0** | 75 |
|  | 2 |
| **1** | 5 |
|  | 2 |
| **1** | 0 |

669,187510 = 1010011101,00112

1. Запишем число в нормализованном виде и убедимся в правильности решения:

(-1)0 \* 1,0100111010011 \* 101001

1. Выполнение задания №6:
2. Представим число 697,1875 в двоичном виде:

69710 = 512 + 128 + 32 + 16 + 8 + 1 = 10101110012

|  |  |
| --- | --- |
| **0** | .1875 |
| **.** | 2 |
| **0** | 375 |
|  | 2 |
| **0** | 75 |
|  | 2 |
| **1** | 5 |
|  | 2 |
| **1** | 0 |

697,187510 = 1010111001,00112

1. Представим число в нормализованном виде:

(-1)0 \* 1,0101110010011 \* 101001

1. Запишем число в мантиссе:

Объяснение:

- для этого запишем в первый бит знак числа (0 – пол. 1 – отр)

- в следующие 8 битов поместим порядок (1001 + 10111 – 1)

- в остальные 23 бита поместим мантиссу (числа после запятой из нормализованного вида)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

1. Представим число 14,375 в двоичном виде:

1410 = 8 + 4 + 2 = 11102

|  |  |
| --- | --- |
| **0** | 375 |
| **.** | 2 |
| **0** | 75 |
|  | 2 |
| **1** | 5 |
|  | 2 |
| **1** | 0 |

14,37510 = 1110,0112

1. Запишем число в нормализованном виде:

(-1)0 \* 1,110011 \* 1011

1. Представим число в виде мантиссы:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

1. Разделим Мантиссы, а порядки вычтем прибавив смещение (1111111):

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**- :**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**=**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Объяснение:

* Деление мантиссы:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| - | 1 | .0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |  | 1 | . | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | . | 1 | 1 | 0 | 0 | 0 | 0 | 1 |  |  |  |  |  |  |
|  |  |  | - | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | - | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 |  |  |  |  |  |  |  |  |

1. Запишем число в нормализованном виде:

(-1)0 \* 1,1100001 \* 101001

1. Проведем проверку в десятичном виде:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| - | 6 | 9 | 7 | .1 | 8 | 7 | 5 | 1 | 4 | . | 3 | 7 | 5 | 0 |
| 5 | 7 | 5 | 0 | 0 | 0 |  | 4 | 8 | . | 5 |  |  |  |
| - | 1 | 2 | 2 | 1 | 8 | 7 | 5 |  |  |  |  |  |  |  |
| 1 | 1 | 5 | 0 | 0 | 0 | 0 |  |  |  |  |  |  |  |
|  |  | - | 7 | 1 | 8 | 7 | 5 | 0 |  |  |  |  |  |  |
|  |  | 7 | 1 | 8 | 7 | 5 | 0 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | 0 |  |  |  |  |  |  |

48.510 = 32 + 16 + 1/2= 110000.12

1. Запишем число в нормализованном виде и убедимся в правильности решения:

(-1)0 \* 1.100001 \* 101001

СПИСОК ИСПОЛЬЗУЕМЫХ ИСТОЧНИКОВ

1. ГОСТ 7.32 -2017 СИБИД. Межгосударственный стандарт. Система стандартов по информации, библиотечному и издательскому делу. Отчет о научно-исследовательской работе. Структура и правила оформления. — Москва, 2017. — 32 с.