Al-Isra University
Faculty of IT
Department of Computer Science

جامعة الإسراء
كلية تكنولوجيا المعلومات
قسم هندسة البرمجيات

| **Department:** CS | **Assignment:** **#2** | **Submission Deadline:** |
|---|---|---|
| **Semester:** Second | **Year**: 2023/2024 | **Instructor** Dr. Dimah Fraihat |
| **Course No.:** | **Course Name:** Computer Design and Organisation | **Section:** 1 |
| **Student No.:** **AD0039** | **Student Name:** فراس سمير سليم | **Submission date :** 10 / 05 / 2024 |

| Question No. | Mark | |
|---|---|---|
| | Max | Score |
| 1 | **2** | |
| 2 | **2** | |
| 3 | **3** | |
| 4 | **3** | |
| **Total Mark** | **10** | |

**1) Convert (50.375)10 to binary number (show your work)**

**Solution:**

**50 to binary**

**50 ÷ 2 = 25 mode = 0**

**25 ÷ 2 = 12 mode = 1**

**12 ÷ 2 = 6 mode = 0**

**6 ÷ 2 = 25 mode = 0**

**3 ÷ 2 = 1 mode = 1**

**1 ÷ 2 = 1 mode = 1**

**50 decemal = 110010 binary**

**0.375 = binary**

**0.375 × 2 = 0.75 = 0**

**0.75 × 2 = 1.5 = 1**

**0.5 × 2 = 1.0 = 1**

**0.375 = 011**

**50.375 decemal = 110010.011 binary**

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**2) Convert (ABC2)16 to its equivalent in Octal (show your work)**

**Solution:**

**2 hex = 0010 binary**

**A hex = 1010 binary**

**B hex = 1011 binary**

**C hex = 1100 binary**

**ABC2 hex = 1010101111000010 binary**

**1010101111000010 binary = 25341 octal**

**3) Convert -0.375 base 10 to binary (show your work) using both one's and two's complement.**

**One's Complement:**

**0.375 to binary**

**0.375 × 2 = 0.75 intger = 0**

**0.75 × 2 = 1.5 intger = 1**

**0.5 × 2 = 1.0 intger = 1**

**0.375 decemal = 0.011**

**One's Complement ➔ - 0.375 decemal = 1.100 binary**

**Two's Complement:**

**0.375 decemal = 0.011 binary**

**- 0.375 decemal = 1.100 binary**

**1.100 + 1 = 1.101**

**Two's Complement ➔ - 0.375 decemal = 1.101 binary**

**4) Find the 1's complement, 2's complement, and sign magnitude representations of the number 00010010**

**Solution:**

## One's complement :

**00010010 = 11101101**

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## Tow's complement :

**00010010 = 11101101**

**11101101 + 1 = 11101110**

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## Sign magnitude:

**0 00010010**

**5) Represent binary -0.0111 in IEEE format**

**Solution:**

**0.0111 ➔ 1.11 * 2 ^ -2**

**Sign bit = 1**

**Exponent = -2 + 127 = 125**

**125 decemal = 01111101 binary**

**Mantissa (Take the first 23 bits of the mantissa) = 11000000000000000000000**

**IEEE = 1 01111101 11000000000000000000000**