Al-Isra University

Faculty of IT

Department of Computer Science

جامعة الإسراء

كلية تكنولوجيا المعلومات

قسم هندسة البرمجيات

Department:	**Assignment:**	**Submission Deadline:**
CS	**#2**	
Semester:	**Year**:	**Instructor**
Second	2023/2024	Dr. Dimah Fraihat
Course No.:	**Course Name:**	**Section:**
	Computer Design and Organisation	1
Student No.:	**Student Name:**	**Submission date :**
AD0039	**Feras Sameer Saleem**	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	2	0
25	2	1
12	2	0
6	2	0
3	2	1
1	2	1

0.375	2	0.75	0
0.75	2	1.5	1
0.5	2	1.0	1

$(50.375)_{10} = (110010.011)_2$

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2) Convert $(ABC2)_{16}$ to its equivalent in Octal (show your work)

Solution:

0	0000
1	0001
2	0010
3	0011
4	0100
5	0101
6	0110
7	0111
8	1000
9	1001
A	1010
B	1011
C	1100
D	1101
E	1110
F	1111

0	0
1	1
2	10
3	11
4	100
5	101
6	110
7	111

$(ABC2)_{16} = (1010\ 1011\ 1100\ 0010)_2$

$(1010\ 1011\ 1100\ 0010)_2 = (25341)_8$

$(ABC2)_{16} = (25341)_8$

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

Converting to Binary (One's Complement):

convert the integer part (0) to binary = 0.

convert the fractional part (0.375) to binary:

0.375	2	0.75	0
0.75	2	1.5	1
0.5	2	1.0	1

➔ $(0.375)_{10} = (0.011)_2$

One's Complement ➔ $(-0.375)_{10} = (1.100)_2$

Converting to Binary (Two's Complement):

➔ $(0.375)_{10} = (0.011)_2$

➔ $(-0.375)_{10} = (1.100)_2$

➔ 1.100 + 1 = 1.101

Two's Complement ➔ $(-0.375)_{10} = (1.101)_2$

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

Solution:

One's complement :

$00010010 \rightarrow 11101101$

Tow's complement :

$00010010 \rightarrow 11101101$

$11101101 + 1 = 11101110$

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 in binary is 01111101

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

➔ 1 01111101 11000000000000000000000