

Homework 1

Max marks: 110

Due on Sept 11th, 2022, 12 noon, before class.

Always show your work/process. Correct final answer is worth less than the correct process. Submit digitally via brightspace.

Problem 1 Convert the each of the following numbers into binary, decimal, hexadecimal, octal numbers. Show your work. Just filling in the values is not enough. (8×6 marks)

	Binary	Decimal	Hexadecimal	Octal
a)	1010 ₂			
b)	10.0110 ₂			
c)		329 ₁₀		
d)		741 ₁₀		
e)			7D ₁₆	
f)			EC3A ₁₆	
g)				351 ₈
h)				2563 ₈

Problem 2 Convert the each of the following numbers into decimal, 8-bit sign-magnitude binary, 8-bit one's complement binary and 8-bit two's complement binary. Show your work. (6×6 marks)

	Decimal	Sign-magnitude	One's complement	Two's complement
a)	-79 ₁₀			
b)	-110 ₁₀			
c)				0110.1110 ₂
d)				1011.1101 ₂
e)			0110.1101 ₂	
f)			1001.1010 ₂	

Problem 3 *Convert the decimal numbers to 6-bit two's complement binary and then add them. Check if the addition causes overflow (3×6 marks).*

1. $-16_{10} - 7_{10}$

2. $19_{10} - 5_{10}$

3. $-4_{10} - 29_{10}$

Problem 4 1. *Convert 299_{10} to binary coded decimal (BCD). (2 marks)*

2. *Convert $1001_0111_0101_{BCD}$ to decimal. (2 marks)*

3. *Convert 0110_1101_{BCD} to binary. (4 marks)*