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)	-250_{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 $1011\_0101\_0101_{BCD}$ to decimal. (2 marks)*

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