Homework 1

Max marks: 110

Due on Sept 11th, 2023, 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)*