Homework 1

Max marks: 110

Due on Sept 9th, 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. (*8×6 *marks)*

	Binary	*Decimal*	*Hexadecimal*	*Octal*
a)	1110_2	*?*	*?*	*?*
b)	10_0100_2	*?*	*?*	*?*
c)	*?*	339_{10}	*?*	*?*
d)	*?*	711_{10}	*?*	*?*
e)	*?*	*?*	$7C_{16}$	*?*
f)	*?*	*?*	$ED3A_{16}$	*?*
g)	*?*	*?*	*?*	371_8
h)	*?*	*?*	*?*	2560_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)	-59_{10}			
b)	-150_{10}			
c)				0100_1110_2
d)				1011_0101_2
e)			0110_1111_2	
f)			1001_1110_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. $-16_{10} - 9_{10}$
2. $19_{10} - 4_{10}$
3. $-3_{10} - 30_{10}$

Problem 4

1. *Convert* 289_{10} *to binary coded decimal (BCD). (2 marks)*
2. *Convert* $1001\_0101\_0001_{BCD}$ *to decimal. (2 marks)*
3. *Convert* 0110_1001_{BCD} *to binary. (4 marks)*