COM1006/COM1090 Devices and Networks (Autumn)

Tutorial Sheet #1: Digital Systems

1. Convert the following decimal integers to their binary equivalents.

    a) 12
    b) 42
    c) 255
    d) 4090

2. Convert the following binary integers to their decimal equivalents.

    a) 101
    b) 1110110
    c) 110111
    d) 11111110111

3. Convert the following binary integers to their hexadecimal equivalents.

    a) 10100110
    b) 1000111000010000
    c) 111100

4. Convert the following hexadecimal integers to their binary equivalents.

    a) 0x28
    b) 0x3E
    c) 0xACDC

	000	001	010	011	100	101	110	111
0000...	NUL	SOH	STX	ETX	EOT	ENQ	ACK	BEL
0001...	BS	HT	LF	VT	FF	CR	SO	SI
0010...	DLE	DC1	XON	DC3	XOF	NAK	SYN	ETB
0011...	CAN	EM	SUB	ESC	FS	GS	RS	US
0100...		!	"	#	$	%	&	'
0101...	(	)	*	+	,	-	.	/
0110...	0	1	2	3	4	5	6	7
0111...	8	9	:	;	<	=	>	?
1000...	@	A	B	C	D	E	F	G
1001...	H	I	J	K	L	M	N	O
1010...	P	Q	R	S	T	U	V	W
1011...	X	Y	Z	[	\	]	^	_
1100...	`	a	b	c	d	e	f	g
1101...	h	i	j	k	l	m	n	o
1110...	p	q	r	s	t	u	v	w
1111...	x	y	z	{	|	}	~	DEL

5. Convert the following ASCII characters into binary strings using the above ASCII table:

   a) Sheffield

   b) 1+2=3

6. Convert the following binary strings into ASCII characters:

   a) 1010000, 1110010, 1100101, 1110100, 1111010, 1100101, 1101100

   b) 0111010, 0101101, 0101001

7. Use the algorithm that repeatedly divides decimal numbers (Lecture 1, slide 15) in order to convert the following decimals into hexadecimal numbers. Instead of dividing by 2, you have to divide by 16 (remainders can be 0-15). Stop after the result of the division has been 0, and read off the results backwards, writing A for 10, B for 11, etc.

   a) 99

   b) 163

8. Use the algorithm that repeatedly multiplies decimal numbers (Lecture 1, slide 18) in order to convert the following hexadecimal numbers into decimals. Instead of multiplying by 2, you have to multiply by 16. Read A as 10, B as 11, etc.

   a) 0x2A

   b) 0x014B