FIT1047
SUPPLEMENTARY WORKSHEET -02
WEEK 05

1- Assume a 32-bit word in a computer. In these 32 bits, you should represent the value Cdf6. If your computer uses 8-bit ASCII with odd parity (i.e. from left to right 7 bit for the character and 1 parity bit), how would the computer represent the string Cdf6.

2- Assume a 16-bit word in a computer. In these 16 bits, you should represent the characters *A5*. If your computer uses 8-bit ASCII with even parity (i.e. from left to right 7 bit for the character and 1 parity bit), how would the computer represent the string *A5*.

3- Given the following truth table

x	*y*	*z*	*F(x,y,z)*
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	1

a. Write the Boolean expression.

b. Draw the corresponding logic circuit.

4- Which MARIE instruction equivalent to the following RTL code:

a.

```
MAR ← X
MBR ← M[MAR]         Load X
AC ← MBR
```

b.

```
MAR ← X
MBR ← M[MAR]         Load X
MAR ← MBR            Store X
MBR ← AC
M[MAR] ← MBR
```

5- How many numbers can be represented by 10 bits?

2^9 numbers in total

6- How many Bytes are in 64 Kilo Byte?

64000 Bytes

7- How many milliseconds are in a second?

8- How many Megabytes are in a Terabyte?

9- How many Gigabytes are in a Megabyte?

10- How many chips are required to design a 64K x 32 memory out of 4K x 8 chips.

64K x 32 = 2^6 x 2^5 = 2^11
4K x 8 = 2^4 x 2^3 = 2^7
Number of chips = 2^11/2^7 = 2^4 = 16 chips

11- Assume a memory that can store 2^{16} bytes. What are the lowest and highest addresses, and how many bits are needed to store those addresses, if the memory is

    a. Byte addressable

    b. Word addressable with a word size of 16 bits

12- Assume a computer architecture, where instructions are 32 bits long, supporting 32 different opcodes, enough bits to address sixteen registers, and the remaining bits to address memory. How many different memory locations can this computer architecture access?