CSCIU 210 01– Computer Organization

Homework-2, Weight: 50 points

Due on Wednesday, September 19, 2018 at the beginning of the lecture (Hard Copy)

Note: You need to include your calculation details to receive full credit!

1. Draw the circuit diagram of AC+AB+ABC' and also determine its truth table.

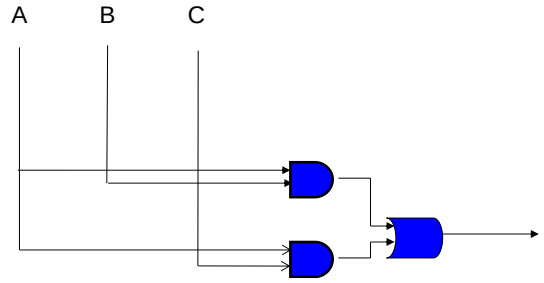
Solution:

The truth table of AC+AB+ABC' is given below

A	B	C	(Output)
0	0	0	0
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

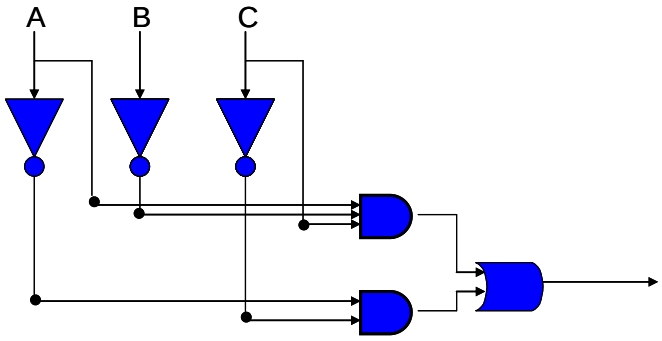
AC+AB+ABC'= AC+AB (1+C')=AC+AB

Its circuit diagram is attached below



2. Determine the truth table of the circuit illustrated below

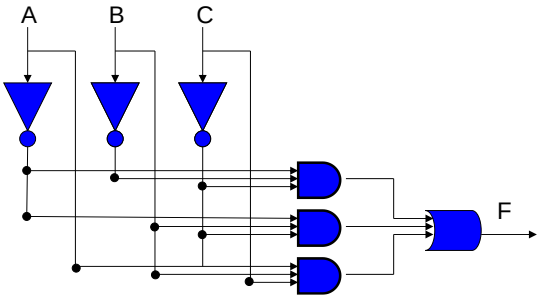
A	B	C	(Output)
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	0
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	0



3. Based on the following truth table, draw the corresponding logic circuit diagram.

A	B	C	F (Output)
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	1

F=A’B’C’+A’BC’+ABC. Its logic circuit diagram is attached below.



4. Convert 1011.1011_2 to a decimal number

Solution: 11.6875_{10}

5. Convert 152.875_{10} to a binary number

Solution: 10011000.111_2

6. Convert 110000111101.11011101_2 to a hexadecimal number.

Solution: $C3D.DD_{16}$

7. Convert $12AC.EF1_{16}$ to a binary number

Solution: $0001001010101100.111011110001_2$

8. How many bits of memory would be found in a personal computer that has the 16 MB of memory size?

Solution:

1 MB is 2^{20} bytes, and a byte is 2^3 bits, so 1MB = (2^{20} bytes) (2^3 bits/byte) = 2^{23} bits.

16 MB= 2^4 MB = 2^{27} bits