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CS4141.116

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PRE-LAB 2

Problem 1.

1.1 How many select bits are used for the 4:1 Mux?

There are two select bits used in the 4:1 Mux.

1.2 Which select bit is the most significant bit?

S_1 is the most significant select bit.

1.3 Suppose S1 = 1, S0 = 0 and 1G = 0, then which signal will be assigned to output 1Y?

1D2 would be assigned to 1Y.

1.4 Now we still have S1 = 1, S0 = 0 but 1G = 1, then what will 1Y be?

1Y would be a 0 because 1G = 1.

1.5 Notice that we also have another set of inputs 2D and output 2Y. Explain how 2Y is related to 2D in one or two sentences

The signal of 2Y will be assigned 2D based on the set of inputs 2D and values of S; however, 2G determines if 2Y is assigned an input value.

Problem 2

2.1 Given G1 and G2 are two enable pins. For the decoder to function, which logic value should we assign to G1 and G2?

G1 = G2 = 0

2.2 In a decoder, basically we select one output (among all outputs) based on the inputs.

Suppose we set the enable pins correctly, and we set A = 0, B = 1, C = 0, D = 1, which output is chosen?

Because outputs are low, the output is 10.

2.3 The chosen output is high or low based on the IC pinout?

The selected will be low while all else will be high.

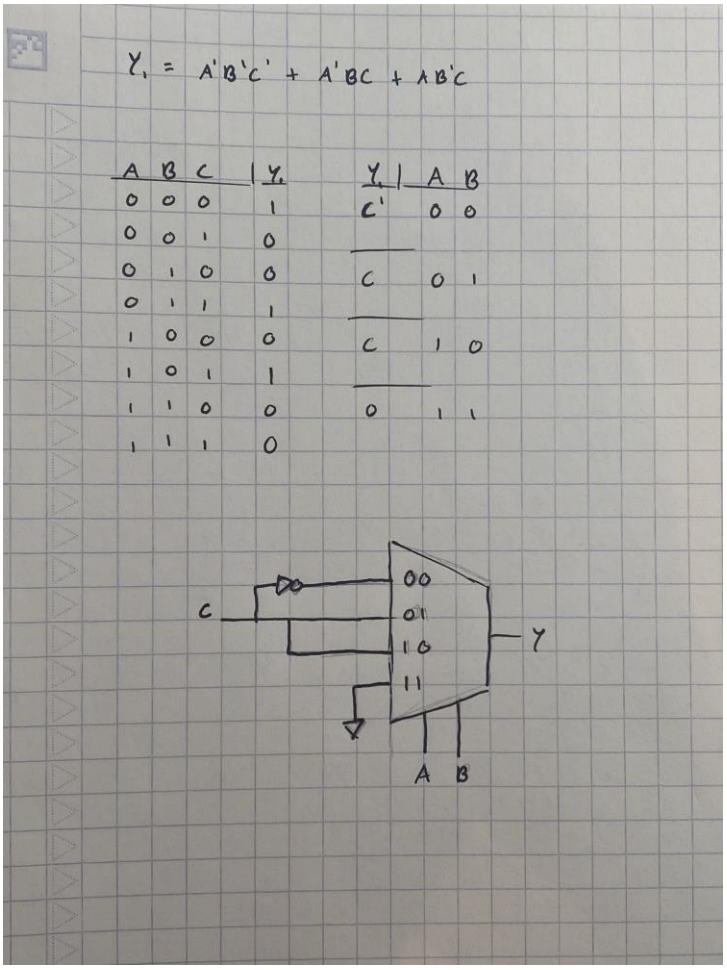
2.4 Given that the output number indicates the decimal value of the inputs, which input (A or B or C or D) should be considered the most significant bit?

A is the most significant bit.

2.5 Given that the output number indicates the decimal value of the inputs, which input (A or B or C or D) should be least significant bit?

D is the least significant bit.

Problem 3


Y1 = A'B'C' + A'BC + AB'C
A B C | Y1
0 0 0 | 1
0 0 1 | 0
0 1 0 | 0
0 1 1 | 1
1 0 0 | 0
1 0 1 | 1
1 1 0 | 0
1 1 1 | 0
Y1 | A B
C' | 0 0
C | 0 1
C | 1 0
0 | 1 1
C
00
01
10
11
Y
A B

Problem 4