Name: _____   SSN: _____

Welcome to the lab quiz in Computer Logic design lab (CDA 3201L). You have 75 minutes. Read each problem carefully. There are eight required problems (each worth 12 points and neatness will fetch you four points) and one extra credit problem worth five points. You may have with you (on your desk, that is) a calculator, pencils, erasers, and blank paper. Please start each numbered problem on a new sheet of paper (unless otherwise stated) and do not write on the back of the sheets. Submit everything in problem order. No sharing of calculators. Pin diagrams for the TTL Chips are provided at the end of the quiz. Good luck and be sure to show your work!
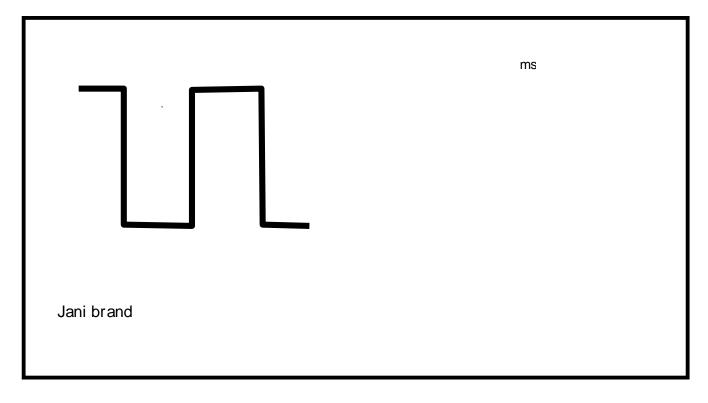
Problem #1 (5 minutes)

What are the key differences between 74XX and 54XX series TTL chips.

54XX series meets more stringent military specifications.
54XX series operate in wide range of temperature and Voltage swings
54XX series are more expensive than 74XX series

Problem #2 (10 minutes)

Determine the time period of the square wave in the oscilloscope figure below. Give also magnitude of the signal in millivolts.
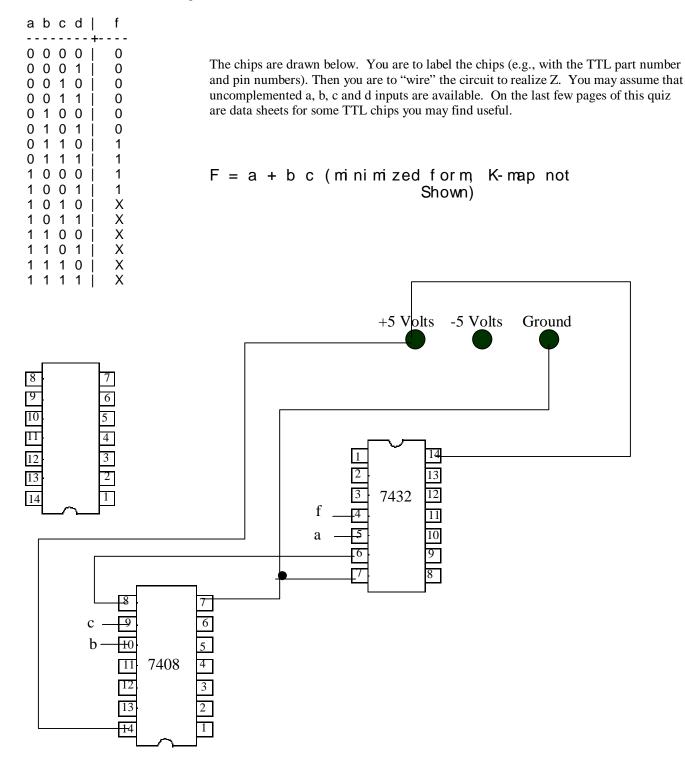
ms

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Jani brand

Time Period: 6 div X 20 ms = 120 ms

Signal Voltage = 6 div X 1 Volts = 6 V= 6000 mV

Problem #8 (15 minutes)

You are to realize the truth table given below .

```
a b c d |  f
--------+----
0 0 0 0 |  0
0 0 0 1 |  0
0 0 1 0 |  0
0 0 1 1 |  0
0 1 0 0 |  0
0 1 0 1 |  0
0 1 1 0 |  1
0 1 1 1 |  1
1 0 0 0 |  1
1 0 0 1 |  1
1 0 1 0 |  X
1 0 1 1 |  X
1 1 0 0 |  X
1 1 0 1 |  X
1 1 1 0 |  X
1 1 1 1 |  X
```

The chips are drawn below. You are to label the chips (e.g., with the TTL part number and pin numbers). Then you are to "wire" the circuit to realize Z. You may assume that uncomplemented a, b, c and d inputs are available. On the last few pages of this quiz are data sheets for some TTL chips you may find useful.

F = a + b c (minimized form, K-map not Shown)

Extra Credit: (5 minutes)

List three practical ideas for improving the lab. The ideas should not entail additional resources. For example, having a lab TA available for consultation 24 hours per day, 7 days per week might be nice, but it is not practical.