Digital Design Preliminary Exam (Fall 2013)

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Total: 100 points

Name or Student ID: ____________________________

Date: 10/25/2013
Problem 1

Implement the following Boolean function using

(a) Multiplexer and then implement with a
(b) Decoder and finally, implement using
(c) Logic Gates.
Label all devices, inputs and outputs.

\[ F(W, X, Y, Z) = \Sigma (0, 1, 2, 3, 5, 6, 8, 9, 10, 12, 13) \]
Problem 2
Design a sequential counter which counts from 0 to 7 and then starts again at 0.

Note: Illustrate the State Table, State Diagram and Sequential Circuit

Implement with JK and T flip-flops.
Problem 4

Draw a PLA circuit to implement the functions

\[ F_1 = AB' + A'C + AB'C' \]
\[ F_2 = (A'B + AC + ABC')' \]