PUE 3141: ADVANCED DIGITAL SYSTEMS DESIGN

ASSIGNMENT 1

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1. Simplify the following Boolean expression:

$$Y = \overline{ACD} + \overline{B\ \overline{(C + A\ \overline{(BD)})}} + \bar{A}B\bar{C}\bar{D}$$

2. Give the following logic expressions as a function of minterms and hence simplify using a K-map.

$$Z = A\bar{B} + \bar{A}CD + \bar{A}\bar{B}C + A\bar{B}C\bar{D}$$

3. Review the following combinational logic modules (symbols & brief description): Multiplexer, binary decoder, magnitude comparator, Adders (full & half-adder)

4. A sequential logic circuit consists of two JK FFs as shown below. Assuming that both flip-flops are initially cleared, obtain the output signal waveforms Q_1 and Q_0 for 5 clock pulses.