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Course Hero

CSEE W4823 Advanced Logic Design
Homework Assignment #1

1. A four-variable logic function that is equal to 1 if any three or all four of its variables are equal to 1 is called a *majority* function. Design a minimum-cost SOP circuit that implements this majority function

2. Convert the following decimal numbers into binary

(a) 17
(b) 33
(c) 67
(d) 130
(e) 2560
(f) 51200

3. Convert the decimal fraction 0.8254 into a binary representation.

4. For the flip-flops in the counter in the figure below assume that t_{su} = 3 ns, t_h = 1 ns, and the propagation delay through a flip-flop is 1 ns. Assume that each AND gate, XOR gate, and 2-to-1 multiplexer has a propagation delay equal to 1 ns. What is the maximum clock frequency for which the circuit will operate correctly?