

In-Class Quiz: March 26

Points: 10/10

✓ **Correct** 1/1 Points

1. In Full-Adder circuit, the propagation delays of the 2-input logic gates are given below. The time taken to produce sum, carry outputs respectively are:

$$t_{EX-OR} = 30 \text{ ns} ; t_{AND} = t_{OR} = 10 \text{ ns}$$

- 30 ns, 40 ns
- 40 ns, 30 ns
- 60 ns, 50 ns
- 60 ns, 60 ns

✓ **Correct** 2/2 Points

2. A 4-bit carry lookahead adder adds two 4-bit numbers. The adder is designed without using EX-OR gates. The propagation delay for all gates is given as 2.4 ns. What will be the overall delay of the adder if we assume that inputs are made available in both complemented and uncomplemented form, and the carry network has been implemented using AND, OR gates only. **(Write your answer only as a floating point number rounded to 1 decimal place. DO NOT WRITE ANY UNITS AFTER THE ANSWER)**

14.4

✓ **Correct** 1/1 Points

3. The number of full and half-adders required to add 16-bit numbers is :

- 8 half-adders, 8 full-adders

- 1 half-adders, 15 full-adders
- 16 half-adders, 0 full-adders
- 4 half-adders, 12 full-adders

✓ **Correct** 2/2 Points

4. In a 8-bit ripple carry adder using identical full adders, each full adder takes 34 ns for computing sum. If the time taken for 8-bit addition is 90 ns, calculate the time taken (in ns) by each full adder to find carry. **(Write your answer only as a single integer. DO NOT WRITE ANY UNITS AFTER THE ANSWER)**

8

✓ **Correct** 1/1 Points

5. Let $S(x, y, z)$ and $C(x, y, z)$ represents the Sum & Carry function of a full adder circuit. Which of the following options best represents $S(x, y, z)$ and $C(x, y, z)$ respectively?


- $x \oplus y \oplus z, y(x \oplus z) + xy$
- $x \oplus y \oplus z, y(x + y + z)$
- $x \odot y \odot z, z(x + y) + xy$
- None of these

✓ **Correct** 2/2 Points

6. A full adder circuit takes 20 ns to generate the carry-out bit and 40 ns for the sum bit. When four 1-bit full adders are cascaded, the maximum rate of additions per second will be $K \cdot 10^6$. What is the value of K? **(Write your answer only as a single integer.)**

10

✓ **Correct** 1/1 Points

7. In a Carry Lookahead Adder, what is the Propagate function which dictates if an incoming carry will be rippled through to the output? 

$p_i = A_i \oplus B_i$

$p_i = A_i \cdot B_i$

$p_i = A_i + B_i$

$p_i = \overline{A_i \oplus B_i}$



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