SER232 - Assignment 4

[10 Points]

Description

This assignment covers drawing timing diagrams based on circuit schematics.

In this assignment you have to create a timing diagram for a given circuit and identify the longest path in the given circuit, which will determine the maximum circuit delay.

Tasks

Create a timing diagram for the following circuit schematic and the case that z changes from 1 to 0 (the other input values are: $x = 1$ and $y = 0$, and do not change):

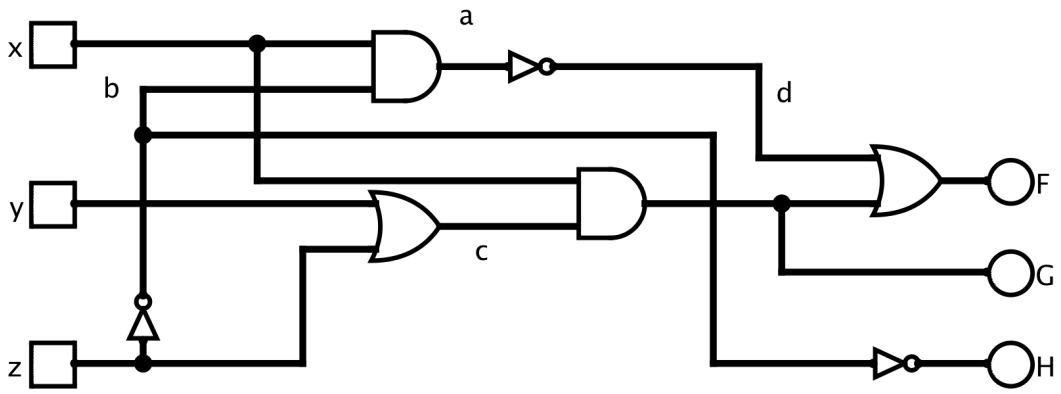

Figure 1: Circuit Schematic

Make sure to include all inputs (x, y, z), outputs (F, G, H) and the indicated intermediate values (a, b, c, d) in your timing diagram.

Answer the following questions:

1. What is the delay of the longest circuit path?
2. What is the delay of the shortest circuit path?

Indicate the delays as number of gate delays. Make sure to consider the entire circuit for finding the shortest/longest circuit path. These delays are not tied to the specific input change that was indicated for the timing diagram, but can be any input change along any possible circuit path.

Put your answers into a single document, which also includes the timing diagram.

Deliverables

The deliverables must be submitted on Canvas before the due date as a single submission:

1. Submit your document as *.pdf*, named: *lastname_a4.pdf*

Important:

- You are allowed to hand-draw this timing diagram, if you are using graph paper and a ruler. Make sure to draw the timing diagram in a clear way and clearly write the labels in the diagram. If parts of your timing diagram are unreadable, you will receive 0 points for the respective parts. This includes how this hand-drawn diagram is included in the pdf file (make sure to take a proper picture on which everything is readable).