37 Lecture - CS302

Important Subjective

1. **What is an input latch in a digital circuit, and how does it work?**
   Answer: An input latch is a logic circuit that stores data temporarily. It consists of a flip-flop and a latch enable input. When the latch enable input is high, the input data is latched, and the output remains stable until the latch enable input is low again.

   Why is reducing the number of input latches in a digital circuit important?
   Answer: Reducing the number of input latches simplifies the circuit, reduces power consumption, and makes it easier to test and debug.

   What are some common techniques used to reduce the number of input latches in a digital circuit?
   Answer: Some common techniques include multiplexing, decoders, and state machines.

   What is the trade-off when reducing the number of input latches in a digital circuit?
   Answer: The trade-off is that the circuit becomes less flexible and has reduced functionality.

   How can reducing the number of input latches affect the performance of a digital circuit?
   Answer: Reducing the number of input latches can improve the performance of a digital circuit by reducing its complexity and power consumption.

   What are some applications where reducing the number of input latches is particularly important?
   Answer: Applications where power consumption is critical, such as mobile devices, wearables, and IoT devices.

   What are the advantages of using state machines to reduce the number of input latches in a digital circuit?
   Answer: State machines can reduce the number of input latches by using fewer inputs to encode a sequence of states.

   What is multiplexing, and how can it reduce the number of input latches in a digital circuit?
   Answer: Multiplexing is a technique that uses fewer input signals to select between multiple inputs. It can reduce the number of input latches by combining multiple inputs into a single signal.

   What are the disadvantages of reducing the number of input latches in a digital circuit?
   Answer: The main disadvantage is reduced flexibility and functionality.

   What are some considerations that designers must take into account when reducing the number of input latches in a digital circuit?
   Answer: Designers must consider the trade-offs between functionality, performance, power consumption, and cost. They must also ensure that the reduced number of input latches does

not compromise the circuit's ability to perform its intended function.