LISTENING PRACTICE 5

LISTEN AND FILL IN THE BLANKS

VLSI Job Interviews and Project Development

1. Applying for a VLSI Job

- First impression: (1) _____
- Projects aligned with the job role → higher chance of (2) _____
- Interview process:
  - Test basic knowledge
  - Discuss (3) _____ in detail

Frontend VLSI

- **Design role:** (4) _____ , design choice, optimization for area, power and (5) _____
- **Verification role:** Understanding the (6) _____ and testing all possible scenarios
- **(7) _____:** physical implementation up to routing, (8) _____, timing closure and clock building

Key point: Choose relevant projects and understand the related (9) _____ thoroughly.

2. Building a Complete VLSI Project

- Complete VLSI flow: RTL to GDS
- Design (10) _____ in Verilog
- Write a test bench and test the design
- Synthesize the (11) _____
- Implement the design up to the final layout

3. Designing a 4-bit Adder

Choosing the (12) _____

- Two optimization goals:
  - Speed/performance → carry lookahead adder
  - (13) _____→ ripple carry adder

Design and testing procedure

- Design both circuits on paper.
- Compare area and speed.
- (14) _____ the circuits in Verilog.
- Write a test bench and test all possible cases.
- (15) _____ the circuits and compare their speed
- Synthesize the verified code.
- Examine the synthesized hardware.
- Identify and remove (16) _____.
- Example: the first bit has no carry input, so a half adder is sufficient instead of a full adder.
- Apply this approach to improve the design.
- Write the code, synthesize it, identify improvements, (17) _____ and refine RTL code.

LIVEWORKSHEETS

4. Starting Backend Implementation

- Once the RTL is ready, begin backend implementation.
- First, synthesize the code.
- Continue through the physical implementation process until the final layout.

5. Physical Implementation: Synthesis

Understanding synthesis

- Convert RTL code into a (18) _____
- Example: adding two 4-bit numbers with a carry.
- Goal: obtain the hardware described by the RTL code.
- Thinking about the synthesized hardware while writing RTL
- For simple designs, engineers can draw the (19) _____ directly.
- Use a synthesis tool for complex designs

Synthesis tool inputs

- RTL code
- The (20) _____ which comes from the fab where the design will eventually be manufactured, contains the gates, flops and latches.

LIVEWORKSHEETS