Analog Devices

PROFILE: CORE

Name of the Role: Design and verification Engineer

Number of offers: 3-4

GPA cut-off: 7.5 / 8 + (keeps changing every year)

Eligible departments: CSE, ECE, EEE, ICE

Process involved: Online written test and Technical Interviews (mostly 3)

Test Details:

Step 1 – OT (approx. 1 hour):

The test consists of a subjective paper with questions from Analog and Digital Systems (and mostly no aptitude). Analog consists of questions related to Circuit Theory and Analog Signal Processing, Zener Diode, BJTs, JFETs, e-MOSFETs, and d-MOSFETs. Questions on characteristics of these devices and know-how of analyzing complex circuits (like amplifiers and filters), which incorporate these elements, were asked. H-parameter modeling of transistors was asked in OTs as well.

Digital systems covered questions on Flip-flops, encoder-decoders, FSMs, MUX-based combinational design, minimising the boolean expression and designing an expression with a minimum number of gates, implementation using MUX and decoders, and STA. Digital design and signal processing were the main subjects from which questions will be asked.

In RC circuits, questions on different configurations and time-domain analysis of circuits were asked. In signal processing, understanding of all the formulas and their different variations was required to attend the section. Filters were asked prominently in this section as well.

Step 2 – Technical Interviews (3/4 for 3 hours approx.):

The technical interview was 3 hours long. Try to remain calm and level-headed throughout the interview. If you couldn't answer the question precisely, speak out your thoughts and the interviewer might guide you with hints.

- Digital design and signal processing: Be thorough with the summer internship project. Digital design questions are challenging and require a lot of practice and knowledge. Ex: Design a digital circuit that generates a square counter (1,4,9...etc.) every clk cycle.

Given a 32-bit input number X and an 8-bit input number Y, design a combinational logic circuit that rotates the number X by Y times. (Barrel shifter)
Rising edge detector 4. Given 1<M/L<2.
Design a circuit that outputs the following sequence every clk pulse. M%L, 2M%L, 3M%L.... etc.,

- Signal processing: Questions were relatively easy and can be done with practice. You need to be good with Fourier transforms and plotting the frequency response.
  Ex: Plot the 1024 point FFT of the given input signal.
  Questions based on Nyquist sampling theorem.
  They didn't focus on the projects or interns. They were more interested in the way you approach a problem and your thinking.

Preparation:
Practice CPC questions. Looking through previous year analog devices questions from the internet gives you a clear perspective of what they expect.

- You can refer to books like Circuit Theory by Ramakalyan Sir, Hayt and Kemmerly and Alexander and Sadiku for general circuit theory and Electronic Devices and Circuit Theory by Robert Boylestad.
- You can refer to the book - Digital Electronics by Morris Mano.

JOB DETAILS:

A typical day in this role:
This depends on the team you get into, such as working with ADCs, DACs, precision converters, doing firmware development depending on the requirements, or testing the circuits and scripting the tests.

Expectation vs. Reality:
I did not expect a private company to have an excellent work-life, but the work-life balance at Analog Devices is excellent. Analog Devices have a well-structured work life.

Your Growth in 1-2 years:
Learning depends on the team you work for. Get exposure to various domains. They assign mentors to help you out, conduct multiple doubt clearing sessions, and fund the courses you want to take and learn. So growth is completely dependent on an individual's interest.

Projects and tasks given:
Initially, projects given are comparatively easy with buffer deadlines where you can work individually and learn simultaneously. Capture the requirements of the project and keep in touch with other teams as well. Testing and making reports were major tasks given during the projects.

Work culture, Employee Benefits, etc. about the company:

It has a great work-life balance. They won't expect you to work overtime. If at all you have to, then compensation is given as well. There are many helping hands to guide you out with projects and other tasks. Initially, deadlines are not strict and give you more space not to feel pressured. All the requirements of the employees have been looked after. They provide a good number of leaves and also Iiprovide random bonus payouts twice a year. Even during Covid, there were no pay cuts. WFH allowance was given to every employee.
ADI respects their employees' time and recognizes them for very efficient work.

Any advice from your side:

Focus on the electronics subjects and the topics mentioned. You need to be well versed (in-depth study) with concepts, such as

- how to implement a 16-to-1 multiplexer with only 2-to-1 and 4-to-1 multiplexers
- how to implement a decoder with a higher number of inputs with decoders with a lower number of inputs
- how to implement a boolean function with only decoders/only multiplexers/only 2-to-1 muxes/4-to-1 muxes with additional logic gates, etc., or any other kind of restrictions.

You should know how to analyze circuits and find missing gates given inputs and outputs. You need to be able to analyze complex flip-flop circuits and derive their state diagram, and use it to solve questions. Vice versa, if a state diagram is given, you should be able to identify (or, in some cases, draw the circuit with a detailed explanation).

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