Q1: List out semiconductor products and its corresponding companies.

GPUs: NVIDIA, AMD

Microprocessors: AMD, INTEL, Qualcomm

ICs: STMicroelectronics, Analog devices, Texas Instruments

Radio frequency ICs: Qualcomm, Broadcom

Microcontroller: NXP, STMicroelectronics

SoC: MediaTek, Qualcomm, Apple

Q2: What are the latest laptop processors from AMD, intel, and apple: frequency and node.

INTEL: i9 12950HX 3.6-5GHz, 10nm

AMD: Ryzen 9 5900HX 3.3-4.6GHz, 7nm

Apple: M2 3.49GHz, 5nm

Q3: What are the latest mobile processors available from Qualcomm and MediaTek: frequency and node.

Qualcomm: snapdragon 8 Gen 3; 4nm 3.3GHz

MediaTek: Dimensity 9300 4nm, 3.25GHz

Samsung: Exynos 1380; 5nm, 2.4GHz

Apple: Apple silicon A17pro, 3nm TSMC, 3.78Ghz

Q4: What are different job roles available in VLSI field?

Ans: Physical design, STA, Power delivery network (PDN), Synthesis engineer, RTL design engineer, Design verification, design for testability (DFT), Pre-Silicon validation, Post-Silicon Validation, Test engineer, Synthesis Engineer, Physical verification, Formal verification,

Q5: Why moved from BJT to MoSFET and finally to FinFET?

MoSFETs can be connected in parallel as compared to BJTs, that makes former more power effective. It is more stable to thermal changes than BJTs. Generally providing constant voltage than constant current is easy as we already know MoSFET is VCVS (Voltage controlled voltage source) whereas BJT is CCVS (Current controlled voltage source).

MoSFETs have the problem of short channel effects in deep submicron technology therefore FinFET is more preferred over former. Leakage current is less in FinFET as compared to MoSFET. FinFET has better gate controllability as compared to gate of MoSFET.

Q6: Evolution of memory

Memory is a storage part in a computer system. It is used to store the data, information, and programs at the time of processing on the computer. It stores data either temporarily or permanent. The main use of memory is saving and retrieving data. Briefly evolution of memory is explained below followed by classification of memory.

Punch cards: These were the first form of data memory, invented in the 18th century and used until the mid-1980s. They were thin pieces of paper with holes punched in them, representing binary data. They were used to store and process data for various machines, such as looms, calculators, and computers.

Magnetic tape: This was the first form of magnetic storage, patented in 1928 and widely used in the 1960s and 1970s. It was a thin plastic tape coated with magnetic material, which could store data by changing the polarity of the magnetic domains. It was used for backup, archival, and audio recording purposes.

Magnetic disk: This was the first form of random-access memory (RAM), invented in 1951 and still used today. It was a circular metal disk coated with magnetic material, which could store data by changing the polarity of the magnetic domains. It was used for fast and direct access to data, as well as for booting and running programs.

Flash memory: This was the first form of non-volatile memory, invented in 1980 and still used today. It was a type of electrically erasable programmable read-only memory (EEPROM), which could store data by changing the state of transistors. It was used for portable and removable storage devices, such as USB drives, memory cards, and solid state drives.

Mainly memory is classified in Primary and secondary.

1. Primary Memory: It is called the internal memory of the computer. Primary memory is generally of two types.
    - RAM
    - ROM

    RAM (Random Access Memory) − It stands for Random Access Memory. RAM is a read /writes memory. It is referred as main memory of the computer system. It is a temporary memory. The information stored in RAM is lost whenever the power supply to the computer is switched off.

RAM is also of two types which are as follows –

- Static RAM: Static RAM also known as SRAM. In this RAM the information is stored as long as the power supply is on. SRAM are of higher cost and consume more power. They have higher speed than DRAM.
- Dynamic RAM: Dynamic RAM also known as DRAM. This type of RAM stores information for very short periods of time, a few milliseconds. DRAM is cheaper and of moderate speed and also, they consume less power.

ROM (Read Only Memory) − It stands for Read Only Memory. ROM is a permanent type of memory. ROM information is not lost when power supply is switched off. The Content of ROM is inserted by the computer manufacturer and permanently stored at the time of manufacturing. ROM cannot be overwritten by the computer. It is also called Non- Volatile Memory.

ROM memory has three types of names which are as following –

- PROM (Programmable Read Only Memory): It is used to write data once and ream many times.
- EPROM (Erasable PROM): EPROM chip can be programmed by erasing the information stored earlier in it.
- EEPROM (Electrically Erasable PROM): It is programmed and erased by spatial electrical waves in milliseconds. A single byte of data or entire content of device can be erased.

2. Secondary Memory: It is an external memory of the computer. It is also known as Auxiliary memory or permanent memory. It is used to store different programs and the information permanently. We call it a non-volatile memory that means the data is stored permanently even if power is switched off. Secondary storage devices are as follows:
    - USB
    - HDD
    - SDD
    - Pen drive