TASK I

VLSI

Q1 Why we moved from BJT to Mosfet ?

- MOSFETs have faster switching speeds and lower switching losses than BJTs. BJTs have switching frequencies of up to hundreds of kHz, while MOSFETs can easily switch devices in the MHz range. So, for high-frequency applications where switching losses have a major role in the total power loss, MOSFET is preferred.
- The dimensions of MOSFET can be scaled down with lesser fabrication costs than BJTs.
- MOSFETs are more costly than BJTs. Their higher price tag is well-spoken as they do not suffer from a secondary breakdown issue like BJTs. MOSFETs are more costly than BJTs. Their higher price tag is well-spoken as they do not suffer from a secondary breakdown issue like BJTs.

Q2 Difference between Mosfet and Finfet.

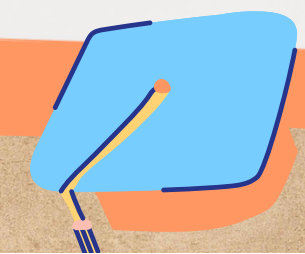
- Speed: Fast switching times in FinFET can be attributed to a higher drive current. otherwise, three-dimensional FinFET is a high-speed device when compared to planar MOSFETs.
- Construction: FinFET technology makes it simple to create multi-gate devices. In MOSFET planner construction makes multi-gate construction difficult.
- .Leakage power: The length of the gate has a significant impact on reducing leakage current as a result of leakage power. FinFET has sufficient gate length because the gate is wrapped around the drain-source channel, and there is no leakage current when the gate is not energized.
- Scalable: A large number of transistors can be housed on a single chip. FinFET technology is suitable for IC fabrication because it is more scalable per footprint area than MOSFET.

Q3 Difference between Ram and rom and their evolution.

- RAM can't hold data without power, ROM can.
- ROM is a permanent type of storage, while RAM is a temporary type of storage.
- ROM is nonvolatile, meaning it does not require a constant source of power to retain information integrity. RAM is volatile, meaning all information is lost when the power is removed.
- RAM is used during the normal operation of a computer. ROM is primarily used during computer start-up or bootstrapping.
- RAM is significantly faster than ROM.
- Increasing RAM increases the performance of a computer.

Q4 List out the mobile and laptop processors, frequency, process node.

- Intel – Intel Core i9-12900K : frequency-3.2GHz-5.3GHz, node – 10nm
- Apple – Apple M1 Max : frequency- 3.2-3.8GHz, node -5nm
- AMD – AMD Ryzen 95900HX : frequency- 3.3-4.6GHz, node – 7nm



VLSI

Q5 List out the semiconductor products and their companies.

- Microprocessors: Intel, AMD, Qualcomm, Apple
- Microcontrollers: STMicroelectronics, NXP Semiconductors
- Power Management ICs: Texas Instruments, ON Semiconductor
- Field-Programmable Gate Arrays (FPGAs): Intel, Xilinx
- Power Semiconductors: STMicroelectronics, Infineon Technologies
- Integrated Circuits (ICs): Texas Instruments, STMicroelectronics

Q6 What are the different job roles available in VLSI field.

Design Engineer subdomains – According to the technology employed

- ASIC – Application Specific Integrated Circuit design
- FPGA – Field Programmable Gate Arrays
- AMS – Analog Mixed Signal design
- DFT – Design For Test
- Custom Designs – Transistor level

Design Engineer – Designation specific titles

- Front-end designer – ASIC/FPGA
- Back-end designer

Verification Engineer subdomains – According to the stage of development

- Front-end verification – simulation
- Hardware Software co-verification
- Product validation – Validating the EDA tools
- Behavioral Modeling – modeling the design

Verification Engineer – Designation specific titles

- Front-end verification engineers
- Validation engineers
- Modeling engineers
- Verification Consultants

Marketing & Sales

COMPANIES

- STMicroelectronics
- Microchip Technology
- Broadcom Corporation
- HCL Technologies
- Cypress Semiconductor Corporation

-ARPITA SINGH