Assignment -01

1. ***List out the semi conductor products and its corresponding companies.***

1. **Saankhya Labs:**

   Semiconductor Solutions

2. **ASM Technologies:**

   Semiconductor Engineering

3. **Broadcom Inc:**

Semiconductor and Infrastructure Software Solutions

4. **Chiplogic Technologies:**

   Semiconductor Design Services

5. **CDIL:**

   Semiconductor Manufacturer

6. **MosChip :**

   Semiconductor Technologies
   Fabless Semiconductor

7. **Einfochips:**

   Semiconductor Design Services

8. **Tata Elxsi:**

   AI, Machine learning, NLP

9. **Semi-Conductor Laboratory:**
   R&D in Semiconductor Technology

10. **NXP Semiconductors :**
    Semiconductor Startup Incubation

2. What are the latest laptop processors from AMD, Intel and Apple :Frequency and node.

- **AMD (AMD Ryzen 9 5900HX)**

Frequency : 3.3 GHz – 4.6 GHz

Node : 7nm

- **Intel (Intel Core i9-12900K)**

Frequency : 3.2GHz – 5.3GHz

Node : 10nm

- **Apple (Apple M1 Max)**

Frequency : 3.2GHz -3.8GHz

Node : 5nm

3. Difference between RAM and ROM and their evolutions?

ROM

- ROM is cheaper when compared to RAM. The speed of Read-only Memory (ROM) is slower when compared to RAM.

- Data in ROM can only be read, it cannot be modified or erased.
- ROM is a permanent type of storage
- ROM is nonvolatile, meaning it does not require a constant source of power to retain information integrity.
- ROM is primarily used during computer start-up or bootstrapping.

RAM

- Data in RAM can be modified, erased, or read.
- RAM can’t hold data without power.
- RAM is a temporary type of storage.
- RAM is volatile, meaning all information is lost when the power is removed.
- RAM is used during the normal operation of a computer.

- RAM is significantly faster than ROM.

Increasing RAM increases the performance of a computer.

4. What are the different job roles available in vlsi field.

- AMS (Analog Mixed Signal) designer
- AMS verification engineer
- Layout design engineer
- ASIC front-end designer
- ASIC verification engineer
- Physical design engineer
- DFT engineer
- Application engineer technical support
- Board validation engineer
- Corporate Application Engineer (CAE)
- EDA/CAD engineer

- EDA tool validation engineer
- Fab/Foundry Engineer
- Field Application Engineer (FAE)

5. Why we moved from bjt to mosfet?

- MOSFET is more tolerant to heat (stable to thermal changes) and can simulate a good resistor.

- MOSFET is usually more efficient switches for power supplies. BJT will consume more power because it's wasting current when it's switch on. Also the BJT generally has a 0.3v voltage drop in the input pin, and it takes a lot of base current to do that.

- MOSFET’s have high input impedance(goes infinity at lower frequencies)

- MOSFET’s are power efficient as the outputs are controlled by input voltage instead of input current.

- In electronics, we basically innovate new circuits with better power effeciency. For that ,many switching circuits are sometimes connected together. MOSFET’s can be directly connected in parallel but BJT can’t. They need emitter resistances which will again consume power and decrease power efficiency.

- Current Mirror Circuits made from MOSFET are far better than that with BJT.

6. Difference between MOSFETS and BJT.

- 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. For digital circuit designers, the dimensions of MOSFET can be scaled down with lesser fabrication costs than

BJTs. MOSFETs are highly used in memory devices such as microprocessors.

- 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.

BJT	MOSFET
It is bipolar	It is unipolar
It is a high-voltage, low- current device	It is a low-voltage, high-current device
Lower switching speed	High switching speed/frequency
Hard to drive	Easy to drive
Cheaper	More expensive
Robust	Easily damaged by static electricity
Easy to bias	Difficult to bias