

EE1002 Part II: Overview of Device Technology

1. A semiconductor can be doped with “five-valence electron” atom which is known as _____ to introduce additional _____ or with _____-valence electron atom which is known as _____ to introduce additional _____ to the semiconductor.
2. In a p-type semiconductor, the current conduction is mainly due to the _____ transport in the _____ band.
3. In an n-type semiconductor, the current conduction is mainly due to the _____ transport in the _____ band.
4. Major charge transport mechanisms in semiconductors includes: _____ and _____.
5. MOSFET stands for _____ - _____ - _____ - _____ - _____.
6. A MOSFET has four terminals. They are _____, _____, _____, and _____.
7. Draw the circuit symbols for following MOS transistors:

	Enhancement	Depletion
P-channel		
N-channel		

8. For an P-channel MOSFET, the substrate is _____ (n-type/p-type) semiconductor. The source-drain doping is _____. A depletion layer can be created by a _____ (positive/negative) gate voltage which forces _____ to move away from the insulator/semiconductor interface.

9. The density of microchips has followed an exponential trend that is known as _____.

According to this prediction the number of components that could be crammed into an integrated circuit would double every two years.

10. MOS transistor has advantages of:

- _____
- _____
- _____
- _____

11. The advance of microelectronics is often characterized by the _____ of an MOS transistor.

12. The advantages of device downsizing include:

- _____
- _____
- _____
- _____
- _____
- _____

13. Difficulties for Integrating of ultra-small transistor into giga scale circuits include _____, _____, _____.

14. In future, the number of transistors on a chip may still be increased without reducing their individual size. Those options include: _____, _____, _____.