Basic Concepts of Semiconductors

Comprehensive Course on Analog Electronics

Ankit Goyal • Lesson 1 • Mar 17, 2021

Introduction / Syllabus → Special class

Course structure

1. Daily live class at 7am (Mon-Sat)
2. Every sunday → Quiz
3. Teaching methodology

Handwritten	PDF
① speed = slow	speed = moderate
② more focus on theory & derivation	more focus on problem solving
③ DPP once every 2-3 days	daily assignment
④ 200 - 300 ques	500 - 600 ques (in class)
TRUE (19%)	FALSE (81%)

Q How to utilize my lectures?

Ans ① watch the live class

② merge pdf s.t. 4 slides per page are present

③ for handwritten preferring students

↳ make handwritten notes post class (1hr post class)

④ others make short notes after solving daily assignment highlighting important formulas & concepts.

↳ we can make short notes after every assignment.

Resources to be used

① daily assignment → 500 Q

② PYQ (EE/EC/IN) → 500-600 Q

} 1100 Q | preference order

③ Unacademy app practice

④ weekly quiz

* we will start PYQ series after diode circuits

If you want to use standard book (Theory)

- ↳ Electronic Circuits by Donald Neamen (most detailed)
- ↳ Sedra smith
- ↳ Boylestad
- ↳ Razavi

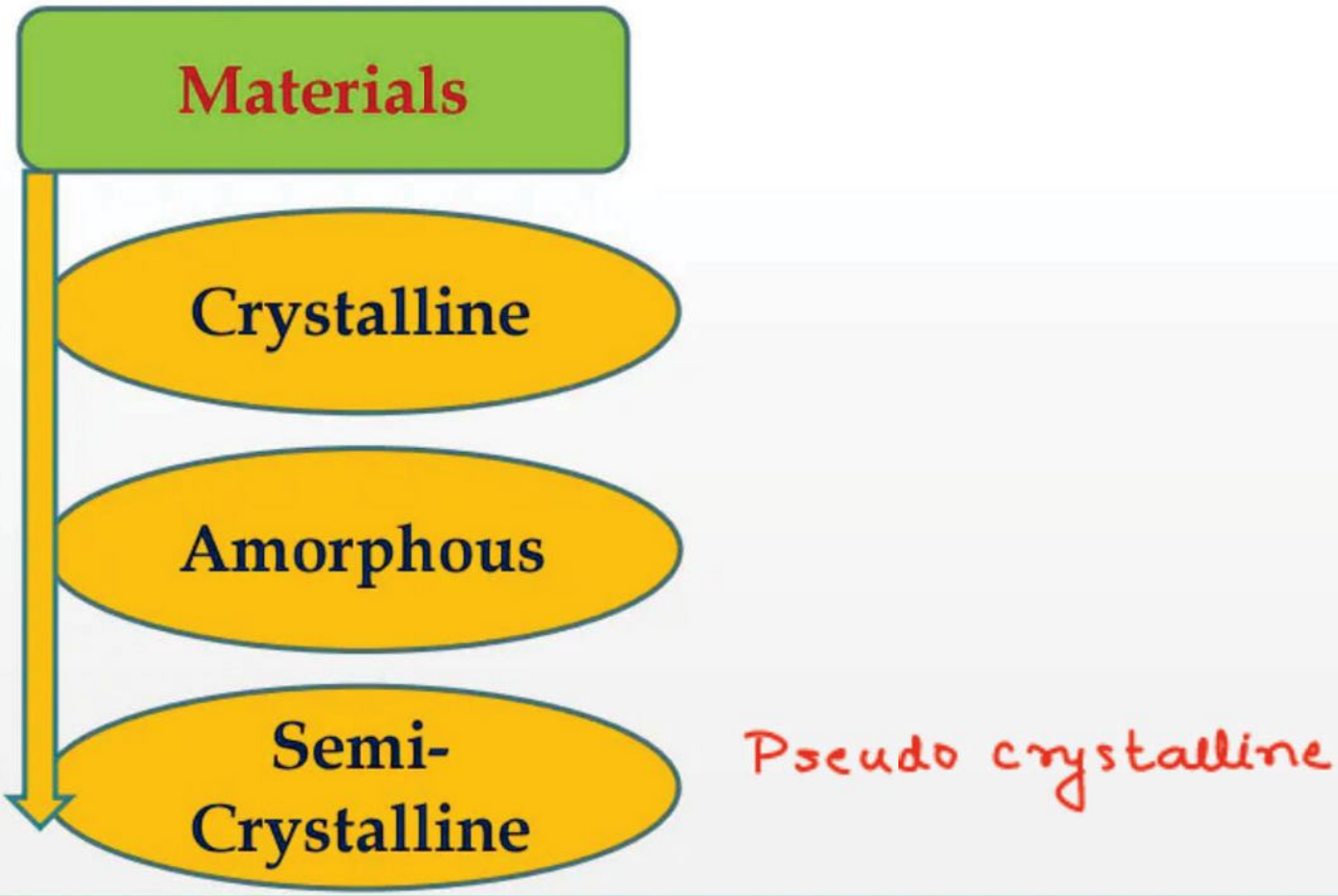
ANALOG ELECTRONICS

Topic covered

1. Semiconductor physics ← today
2. Diode circuit ← from tomm
3. BJT (Biasing, amplifier, frequency response)
4. JFET (ESE not in Gate) ← not covered
5. MOSFET ← GATE
6. Op-amp and application ← most important
7. Feed Back Amplifier
8. Oscillator and 555 timers
9. Power Amplifiers (ESE) ← not covered

* Networks (upto transients) : important for analog

Semiconductor Physics



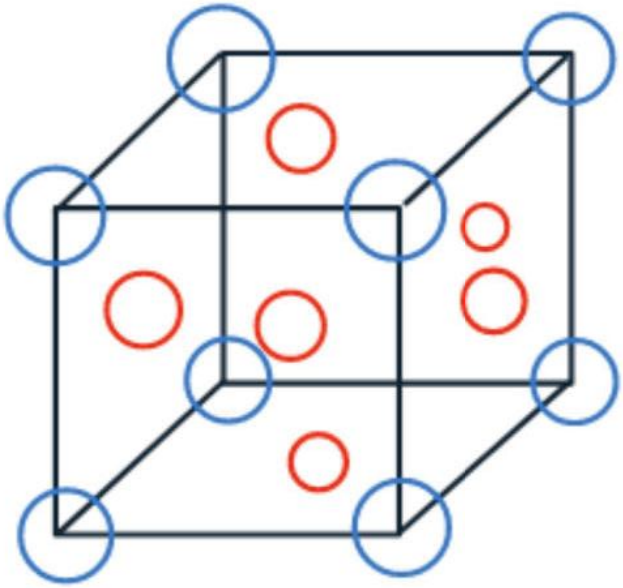
Crystalline

When material have long range order of atoms and they are perfectly arranged the material is called crystalline.

The repeat unit in the crystal is called as unit cell.

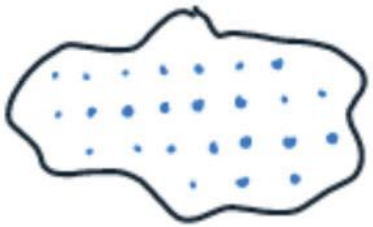
Amorphous

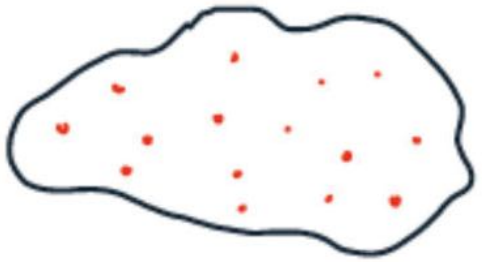
When there is no ordering of atom or the atom are at random then material is called as amorphous.



Crystalline

all atoms are present at fixed locations



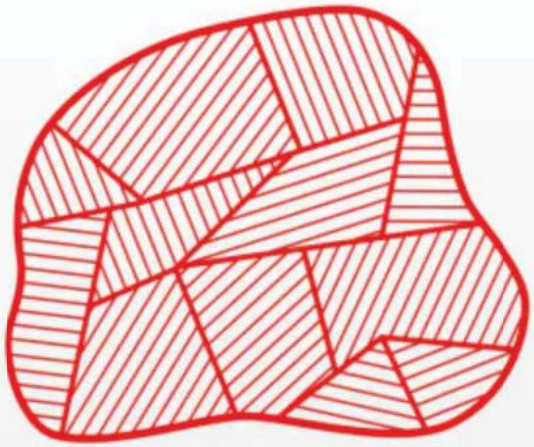


Amorphous

random arrangement of atoms

Semi-Crystalline

The atom are perfectly arranged but only over short distance , over large distance arrangement is random .



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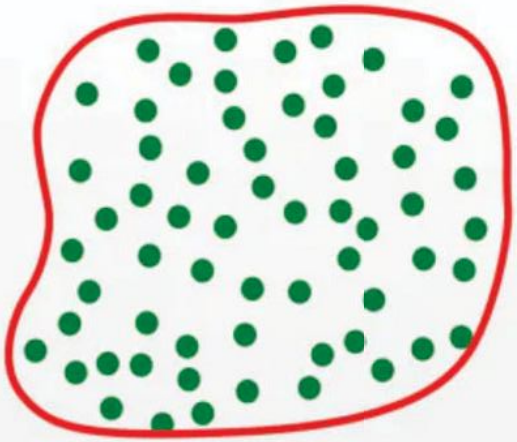
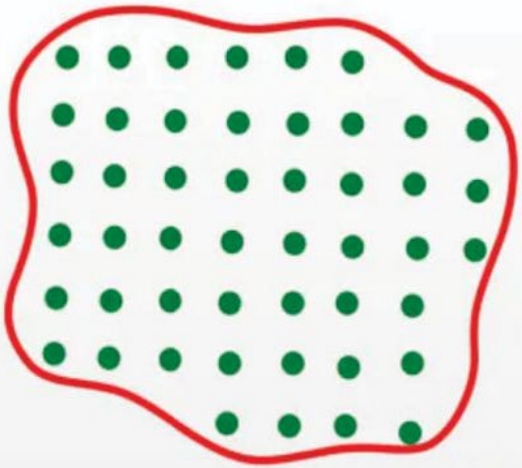


amorphous



Crystalline

(Semi conductors)