29. Biochemistry

- **Proteins**:
- Made of amino acids linked by peptide bonds.
- Primary, secondary, tertiary, and quaternary structures.
- **Enzymes**:
- Biological catalysts that lower activation energy.
- Follow the Michaelis-Menten kinetics.
- **Carbohydrates**:
- Monosaccharides (glucose), disaccharides (sucrose), polysaccharides (starch, cellulose).
- **Lipids**:
- Nonpolar molecules (e.g., fats, oils, phospholipids).
- **Nucleic Acids**:
- DNA and RNA made of nucleotides (phosphate, sugar, nitrogenous base).

30. Solid-State Chemistry

- Explains electrical conductivity in solids.
 Conductors: Overlapping conduction and valence bands
 Semiconductors: Small gap between conduction of covalence bands.
 Insulators: Large gap.
 Defects in Crystals:
 Vacancies: Missing a oms.
 **Interstition * Ether atoms in spaces 0
 Dirocations: Misalignment of planet

31. Advanced Thermodynamics

- **Entropy (S)**:
- Measure of disorder.
- $(\Delta S > 0)$: System becomes more disordered.
- **Phase Transitions**:
- **Critical Point**: Point where liquid and gas phases become indistinguishable.
- **Triple Point**: Temperature and pressure at which all three phases coexist.

- **Clausius-Clapeyron Equation**: Relates pressure, temperature, and enthalpy of phase changes.

32. Nanotechnology and Materials Science

- **Nanoparticles**: Particles in the 1–100 nm range with unique properties.

- **Applications**: