Se define-Software Engineering is the systematic application of engineering principles, methods, and tools to develop high-quality, reliable, and maintainable software.

Intangible – Software cannot be touched physically like hardware; it is a set of programs and instructions.

1. **Engineered, not manufactured** – Software is developed through systematic engineering methods, not assembled on a production line.

2. **Does not wear out** – Unlike hardware, software doesn't degrade with use, but it may need updates due to bugs or environment changes.

3. **Customizable** – Can be tailored to meet specific user requirements.

4. **Complex** – Large software systems are highly complex with many interrelated components.

5. **Evolves over time** – Software needs continuous maintenance and upgrades to adapt to new requirements.

6. **Quality dependent** – The value of software depends on correctness, reliability, usability, and performance.

7. **Human-intensive** – Development depends heavily on human skills, creativity, and collaboration.

CMM model - The Capability Maturity Model (CMM) is a procedure used to develop and refine an organization's software development process.It was developed by the Software Engineering Institute (SEI) and focuses on improving quality by improving the process, rather than focusing only on the product. 3333The model consists of five maturity levels, from Initial (Level 1) to Optimizing (Level 5)
CMM is a framework that assesses and improves the maturity of software development processes in an organization, with levels from *Initial* to *Optimizing*.

SPectrum management - . The management spectrum describes the comprehensive management of a software project, starting from the initial requirement analysis phase and continuing throughout the software's lifecycle1. It provides a framework for controlling and dealing with all aspects of a project to meet deadlines, maintain quality, and ensure productivity..
3 p's People: This includes all stakeholders, from managers and developers to customers and end-users, who are essential for a project's success 3333 . The focus is on attracting, motivating, and organizing the talent needed for software development .
The most important resource; their skills, motivation, and teamwork directly influence project quality and timely delivery.
● Product: This refers to the software being developed. Before a project begins, the product objectives and scope must be clearly defined.Defines the scope, objectives, and

requirements of the software to be developed. Clear product understanding ensures correct outcomes.

● Process: This is the framework chosen to guide the software engineering work. A suitable process model (like Waterfall, Incremental, or Agile) provides the structure for delivering the product in a timely and high-quality manner.