Computer-Aided Engineering (CAE)

- Use of computer systems to analyze CAD geometry
- Allows designer to simulate and study how the product will behave, allowing for optimization
- Finite-element method (FEM)
- – Divides model into interconnected elements
- – Solves continuous field problems

Computer-Aided Design Process

- Two types of activities: synthesis and analysis
- Synthesis is largely qualitative and hard to capture on computer
- Analysis can be greatly enhanced with computers
- Once analysis is complete, design evaluation-rapid prototyping
- Software packages for design optimization

Components of CAD/CAM/CAE Systems

- Major component is hardware and software allowing shape manipulation
- Hardware includes graphic devices and their peripherals for input and output operations
- Software includes packages that manipulate or analyze shapes according to user interaction

Questions

1. Briefly explain the conventional process of the product cycle in the conventional manufacturing environment.
2. What is the structure of a computing system?
3. What do you understand by the CPU?
4. List the advantages of computer aided design.
5. Bring out clearly the diculties a design engineer has to face at each of the design stages if they are carried out manually.
6. How does a CRT work? ii. What are the capabilities and limitations of directed beam refresh graphics terminal? Write briefly on the secondary storage devices used in CAD System.
7. What are the functions of an interactive graphic design workstation?

Lecture No 3 Topic: Computer Aided Design Process

The product begins with a need which is identified based on customers' and markets' demands.

The product goes through two main processes from the idea conceptualization to the finished product:

1.The design process.

2.The manufacturing process.

The main sub-processes that constitute the design process are:

1.Synthesis.

2. Analysis