1. What is Computer Network?

- A collection of autonomous computers and devices interconnected via communication devices and transmission media.

- *Autonomous refers to a complete system unit that means one computer in the network that cannot forcibly start, stop or control another computer in the network. In other words, the computer works independently.*

- Two computers are said to be interconnected if they are able to exchange information.

2. Uses of Computer Networks

- Some of the network applications of the different fields are the following:
  - **Business Applications**
  - **Home Applications**
  - **Mobile Users**

2.1 Business Applications

- **Resource sharing** - programs, data.
- **Saving money** - the client-server model.
- **Scalability** - the ability to increase system performance gradually as the workload grows just by adding more processors.
- **Communication medium –** email.
- **Business electronically -** e-commerce.

2.2 Home Applications

Services delivered by networks to private individuals at home:

- **Access to remote information**
- **Peer to peer communication**
- **Interactive entertainment**
- **Electronic commerce**

2.3 Mobile Users

Issues : connectivity and coverage.

Applications or services:

- Cellular networks
- Text messaging or texting (or Short Message Service, SMS)
- GPS-enabled phone or car
- m-commerce
- Sensor networks

3. Network Criteria

- A network must be able to meet a certain number of criteria. The most important of these are –

1. Performance
2. Reliability
3. Security

3.1 Performance

- Performance can be measured by:
  - Transit time: Transit time is the amount of time required for a message to travel from one device to another.
  - Response time: Response time is the elapsed time between an inquiry and a response.

- The performance of a network depends on a number of factors:
  - The number of users
  - The type of transmission medium
  - The capabilities of the connected hardware
  - The efficiency of the software

- Performance is often evaluated by two networking metrics:
  - Throughput
  - Delay

3.2 Reliability

- the frequency of failure,
- the time it takes a link to recover from a failure, and
- the network's robustness in a catastrophe.

3.3 Security

- Network security issues include
  - protecting data from unauthorized access
  - protecting data from damage and development
  - implementing policies and procedures for recovery from breaches and data losses.