

Chapter 01 – Introduction

Part 01

SECTION A: SCENARIO-BASED QUESTIONS (3 Scenarios)

Scenario 1

A multinational corporation is planning to connect its headquarters in New York with its branch offices in London, Tokyo, and Sydney. They need a network that can span large geographical distances, support high-speed data transfer, and ensure reliable communication between all locations. The company also needs to maintain secure connections for sensitive financial data transmitted between offices.

Question 1.1

What type of network topology would be most appropriate for connecting these geographically dispersed offices, and why?

Scenario 2

A small business with 20 employees has decided to set up a computer network in their single-floor office space. They want all computers to be connected to a central device that manages traffic and allows employees to share files and printers. The network should be easy to manage and expand as the company grows.

Question 2.1

Which network topology would best suit this small business, and what are its key advantages?

Scenario 3

A university research department has five powerful computers that need to work together on complex computational problems. The computers should be able to communicate directly with each other without relying on a central server, ensuring maximum reliability and performance.

Question 3.1

What type of network model would be most appropriate for this scenario, and what are its key characteristics?

SECTION B: MULTIPLE CHOICE QUESTIONS (5 Questions)

Question 1

The _____ is the physical path over which a message travels in a data communication system.

- a) Protocol
 - b) Signal
 - c) Medium
 - d) Path
-

Question 2

In a _____ connection, more than two devices can share a single link.

- a) Point-to-point
 - b) Multi-point
 - c) Primary
 - d) Secondary
-

Question 3

Which topology requires a central controller or hub to manage all communications?

- a) Mesh
 - b) Bus
 - c) Star
 - d) Ring
-

Question 4

_____ is the protocol suite for the current Internet.

- a) UNIX
 - b) NCP
 - c) TCP/IP
 - d) ACM
-

Question 5

Frequency of failure and network recovery time after a failure are measures of the _____ of a network.

- a) Performance
 - b) Reliability
 - c) Security
 - d) Feasibility
-

SECTION C: TRUE/FALSE QUESTIONS (5 Questions)

Question 1

In full-duplex transmission, both stations can transmit and receive simultaneously.

Question 2

A LAN (Local Area Network) typically covers an area larger than 2 miles in diameter.

Question 3

A protocol is defined as the structure or format of data, specifically the order in which they are presented.

Question 4

In a bus topology, one break in the cable media can stop all data transmissions on the network segment.

Question 5

An internet (with a lowercase 'i') is the same as the Internet (with an uppercase 'I').

SECTION D: FILL IN THE BLANK (4 Questions)

Question 1

A data communications system has five components: Message, Sender, Receiver, Transmission Medium, and _____.

Question 2

In a _____ connection, the channel capacity is shared by both sending and receiving devices at all times on a circuit.

Question 3

When a task is divided among multiple computers, this is known as _____ processing.

Question 4

For n devices in a mesh topology, the number of cable links required is _____.

SECTION E: SOLVING AND UNDERSTANDING QUESTIONS (4 Questions)

Question 1

A network administrator is designing a network with 8 devices. Calculate the number of cable links required for each of the following topologies:

- a) Mesh topology
- b) Ring topology
- c) Bus topology
- d) Star topology

Question 2

Explain the difference between half-duplex and full-duplex transmission modes, providing a real-world example for each.

Question 3

List and explain the three criteria necessary for an effective and efficient network.

Question 4

Why are standards important in data communications and networking? Explain with examples.