Bahria University

*Lahore Campus*

*Department of Computer Sciences*

data communication & networking

ASSIGNMENT # 01

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**Program:** BSCS

**Semester: 4th**

1. For each of the following four networks, discuss the consequences if a connection fails.

a. Five devices arranged in a mesh topology

If a single link fails, only the devices connected by that link will be affected. Other devices in the network can still communicate with each other.

b. Five devices arranged in a star topology (not counting the hub)

If a device fails, only that specific device is affected. Other devices can continue to communicate without disruption.

c. Five devices arranged in a bus topology

If the common cable fails, then the whole system will crash down.

also:

If a connection or segment fails, the devices on that segment are isolated from the rest of the network.

d. Five devices arranged in a ring topology

The failure of a single node in the network can cause the entire network to fail.

2. When a party makes a local telephone call to another party, is this a point-topoint or multipoint connection? Explain the answer.

Point to Point Topology

Point-to-Point Topology is a type of topology that works on the functionality of the sender and receiver. It is the simplest communication between two nodes, in which one is the sender and the other one is the receiver. Point-to-Point provides high bandwidth.

In summary, the standard local telephone call, where one party calls another party, is considered a point-to-point connection as it involves communication between two specific entities—the caller and the receiver.

3. In the TCP/IP protocol suite, what are the identical objects at the sender and the receiver sites when we think about the logical connection at the application layer?

the identical objects at the sender and receiver sites are the sockets.

4. A host communicates with another host using the TCP/IP protocol suite. What is the unit of data sent or received at each of the following layers?

a. application layer b. network layer c. data-link layer

b: In networking, the unit of data sent or received at each layer of the OSI (Open Systems Interconnection)

5. Protocol layering can be found in many aspects of our lives such as air travelling. Imagine you make a round-trip to spend some time on vacation at a resort. You need to go through some processes at your city airport before flying. You also need to go through some processes when you arrive at the resort airport. Show the protocol layering for the round trip using some layers such as baggage checking/claiming, boarding/unboarding, takeoff/landing.

Departure (City Airport):

Application Layer:

Process: Ticket booking and reservation.

Presentation Layer:

Process: Payment processing and ticket validation.

Session Layer:

Process: Establishing a session for check-in.

Transport Layer:

Process: Check-in procedures (e.g., submitting identification, selecting seats).

Network Layer:

Process: Baggage checking and routing (e.g., assigning destination tags).

Data Link Layer:

Process: Physical baggage check, attaching barcodes, and sending to the conveyor belt.

Physical Layer:

Process: Actual movement of baggage on the conveyor belt.

Takeoff:

Application Layer:

Process: Boarding pass verification and security checks.

Presentation Layer:

Process: Security screening.

Session Layer:

Process: Boarding process (establishing a session for passengers to enter the plane).

Transport Layer:

Process: Boarding activities, seating arrangements.

Network Layer:

Process: Aircraft preparation, coordination with air traffic control.

Data Link Layer:

Process: Communication between the aircraft and the airport.

Physical Layer:

Process: Actual boarding of the aircraft.

application Layer:

Process: Passport control, customs declaration.

Presentation Layer:

Process: Immigration checks.

Session Layer:

Process: Exiting the aircraft, resort entry procedures.

Transport Layer:

Process: Unboarding activities, collecting belongings.

Network Layer:

Process: Baggage claiming and routing to the resort.

Data Link Layer:

Process: Physical baggage claim, verifying baggage tags.

Physical Layer:

Process: Actual movement of baggage on the conveyor belt for claiming.

Landing:

Application Layer:

Process: Exiting the resort, transportation arrangement.

Presentation Layer:

Process: Checkout and payment for resort services.

Session Layer:

Process: Leaving the resort premises.

Transport Layer:

Process: Transportation to the airport.

Network Layer:

Process: Airport check-in for the return flight.

Data Link Layer:

Process: Physical baggage check and routing for the return journey.

Physical Layer:

Process: Actual movement of baggage on the conveyor belt for checking.