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Homework Chapter 1

1. Define data communication:

Data communication is the process of transferring data between two or more devices using transmission mediums such as cables, optical fibers, or wireless signals. It involves the exchange of data in the form of bits or packets over a network.

2. Explain the key components of a data communication system:

The key components of a data communication system include:

- Sender
- Receiver
- Transmission medium
- Message
- Protocol

3. Describe the role of a sender and a receiver in a communication system:

- Sender: The sender generates the data and sends it over the communication channel.
- Receiver: The receiver takes the transmitted message and processes or interprets it.

4. Explain the difference between analog and digital communication:

Analog communication transmits continuous signals (e.g., radio), while digital communication uses discrete signals (e.g., emails).

5. Define the term 'protocol' in the context of data communications:

A protocol is a set of rules and conventions that govern the transmission of data between devices in a communication network.

6. Why are protocols necessary for successful communication?:

Protocols ensure that all devices in a network follow the same rules for data transmission.

7. List several different types of end systems:

- Computers
- Smartphones
- Servers

- IoT devices

8. List the role of intermediary devices:

- Routers

- Switches

- Modems

9. Differentiate between Intranet, Extranet, and Internet:

- Intranet: A private network for internal use

- Extranet: A private network with restricted external access

- Internet: A global network

10. Differentiate between LAN and WAN:

- LAN: Covers small geographic areas

- WAN: Covers large geographic areas

11. How do ISPs facilitate access to the Internet?:

ISPs provide the infrastructure and services to connect individuals to the Internet.

12. What is the transmission rate of Ethernet LANs?:

Transmission rates are typically 100 Mbps, 1 Gbps, or 10 Gbps.

13. What advantage does a circuit-switched network have over a packet-switched network?:

Circuit-switched networks provide dedicated paths, ensuring consistent data delivery.

14. What is the Internet and describe how it works?:

The Internet is a global network that uses TCP/IP protocols to route data packets between devices across multiple networks.