Unit 4 Networking

Exercise 1

1. A modem: d. modulates and demodulates the data into a digital or an analog signal
2. A repeater: b. channels incoming data but maintains the bandwidth speed.
3. A bridge: h. connects networks that use the same protocol
4. A router: g. connects networks and sends packages of data between them
5. A gateway: a. is an entrance to another network
6. A switch: e. channels incoming data but shares the bandwidth among the devices present on a network
7. A hub: e. channels incoming data but shares the bandwidth among the devices present on a network
8. A wireless access point: c. allows wireless devices to connect to the network

Exercise 2

1. Who are the users?
   The users of the Newtown Health Centre Local Area Network are doctors, receptionists, and the practice manager.
2. What kind of hardware is used?
   The following hardware is used in the Newtown Health Centre Local Area Network:

- Server
- PCs (personal computers)
- Laser printer
- Email connection to hospitals, other practices, and the local health board

3. What do the doctors use it for?
   The doctors use the network for:

- Consultations
- Appointments
- Patient records

4. What do the receptionists use it for?
   The receptionists use the network for:

- Taking calls
- Making appointments
- Answering questions

5. What does the practice manager use it for?
   The practice manager uses the network for:

- Email notifications to hospitals, other practices, and the local health board
- iFinance software

Exercise 3

1. What is a network?
   A network is a collection of interconnected computers or devices that can communicate and share resources with each other. Networks enable the exchange of data, information, and resources, such as files, printers, and internet connections, among connected devices. Networks can be used for various purposes, including data sharing, communication, and collaboration.

2. What are its hardware components?
   Networks consist of several hardware components, including:
   - Computers or devices: These are the endpoints in the network that communicate with each other.
   - Network cables or wireless connections: These are used to transmit data between devices.
   - Network devices: These include routers, switches, hubs, and access points, which help manage and direct data traffic.
   - Servers: Servers store and provide resources or services to network users.
   - Modems: Modems are used to connect to the internet or other networks.
   - Network cards or adapters: These are used to connect devices to the network, either via wired (Ethernet) or wireless (Wi-Fi) connections.

3. What is the difference between a local area network and a wide area network?
   - Local Area Network (LAN): LANs are typically confined to a small geographic area, such as a single building or campus. Devices in a LAN are usually connected via Ethernet cables or Wi-Fi, and data transfer speeds are high. LANs are often used for local data sharing, file sharing, and resource sharing within an organization.

   - Wide Area Network (WAN): WANs cover larger geographical areas and can connect devices or LANs across cities, countries, or even continents. WANs use various technologies, including telephone lines, fiber-optic cables, and satellites. Data transfer speeds in WANs may be slower compared to LANs. The Internet is a global example of a WAN.

4. What advantages do you think networks have?
   Networks offer several advantages, including:
   - Resource Sharing: Networks allow multiple users to share resources such as printers, files, and internet connections.
   - Communication: Networks enable real-time communication through email, instant messaging, and video conferencing.

- Data Transfer: They facilitate the transfer of data and information quickly and efficiently.
- Remote Access: Users can access resources and data remotely from different locations.
- Centralized Data Storage: Networks often include servers for centralized data storage and backup.
- Scalability: Networks can be easily expanded to accommodate more devices or users.
- Cost Efficiency: They can reduce hardware costs as resources can be shared.
- Security: Network security measures can protect data and resources from unauthorized access.

Exercise 4

1. LANs link computers and other devices that are usually placed in the same building. (Correction: LANs are typically local and cover a limited geographical area, such as a single building.)
2. In a client-server architecture, not all the workstations have the same capabilities. (Correction: In a client-server architecture, workstations have different roles, with the server typically having more capabilities than the clients.)
3. The word protocol refers to the standard of communication for a network. (Correction: A protocol defines the rules and conventions for communication within a network.)
4. Routers are used to link a LAN to another network, e.g., to the Internet. (Correction: Routers are used to connect networks, not individual computers.)
5. Access points are connected to a wired LAN to create a WLAN. (Correction: Access points are connected to the wired LAN to enable wireless connections.
6. Wireless adapters are necessary when you are using WLAN. (Correction: Wireless adapters are required to connect your computer to a wireless network.)
7. Hotspots can also be found outside a building, such as university campuses, squares, etc. (Correction: Hotspots can be available outdoors as well.)
8. The Internet is an example of a WAN. (Correction: The Internet is a global WAN, not a LAN.)
9. Wireless WANs use mobile telephone networks for connectivity. (Correction: Wireless WANs can use various technologies, including mobile telephone networks.)

Exercise 5

1. All the PCs on a LAN are connected to one server, which is a powerful PC with a large hard disk that can be shared by everyone.
2. The style of peer-to-peer networking permits each user to share resources such as printers.
3. The star is a topology for a computer network in which one computer occupies the central part and the remaining nodes are linked solely to it.

4. At present Wi-Fi systems transmit data at much more than 100 times the rate of a dial-up modem, making it an ideal technology for linking computers to one another and to the Net in a WLAN.
5. All of the fiber-optic backbones of the United States, Canada, and Latin America cross Panama.
6. A hub joins multiple computers (or other network devices) together to form a single network segment, where all computers can communicate directly with each other.

Exercise 6

1. Should
2. LAN
3. Equipment
4. WAN
5. Recommend
6. Remote
7. VPN
8. internet

Exercise 7

1. Ring
2. Star
3. Mesh
4. Bus

Exercise 9

1. If one of the computer fails, the whole network will be affected.
    - This statement is typically true for a **ring topology**. In a ring network, if one computer or workstation fails, it can disrupt the entire network because the data transmission is interrupted.
2. If we remove a computer from the network, it won't affect the other computers.
    - This statement is generally true for a **star topology**. In a star network, if you remove a computer, it doesn't affect the functionality of other computers on the network since they are not directly interconnected.
3. If the main cable fails, the whole network will fail.
    - This statement is accurate for a **bus topology**. In a bus network, all workstations are connected to a central cable (the bus). If the central cable fails, the entire network loses connectivity.

4. If the central server fails, the whole network will fail.
    - This statement is primarily associated with a **star topology**. In a star network, if the central server (or hub) fails, it can affect the entire network because all other devices are dependent on it for communication.
5. If a cable breaks, the whole network will be affected.
    - This statement is true for **ring** and **bus topologies**. In a ring network, if any cable in the ring breaks, it can disrupt communication. In a bus network, a cable break can similarly disrupt the network because all workstations connect to the same central cable.
6. If a computer fails, it won't affect the other computers.
    - This statement is associated with **star and mesh topologies**. In a star network, if one computer fails, it does not impact the operation of other computers because they are not interconnected. In a mesh network, even if a single computer fails, it won't necessarily affect other computers due to multiple connections.

Exercise 11

1. If she **needs** a computer, her brother **will give** her his computer.
2. If she **does not read** the Computer Networking module and her notes, she **will not pass** the test.
3. If they **do not invite** me to the computer workshop, I **will not go**.
4. The administration staff **will accept** his thesis draft if Rama **turns in** his thesis draft on time.
5. If you **want** remote access to your company's LAN, you **will set up** a Virtual Private Network.
6. If Anugrah **needs** to connect devices over a small area, he **will need** to set up a LAN.

Exercise 12: Link each action (1-10) with a suitable consequence (a-j). Then, combine them using if-clause

1. If you place a floppy disk near a magnet (g), you will destroy the data.

2. If you press print screen (e), you copy the screen.
3. If you input the correct password (f), you have access to the network.
4. If you add memory to a computer (h), it runs faster.
5. If you move the mouse to the left (a), the cursor moves to the left.
6. If you store data in RAM (c), it is not lost when you switch off.
7. If you use a faster modem (i), your phone bills are lower.
8. If there is a memory fault (b), the computer hangs.
9. If you press the arrow key (j), the cursor moves across the screen.
10. If you move a CD-ROM drive with the disk in place (d), you damage the drive.

Exercise 13

Student 1: Good morning! I've noticed our collage Wi-Fi connection is quite slow lately, and it's affecting my work.

Student 2: Good morning! You're right; the network speed has been an issue. If we don't upgrade our modem, our network will continue to be slow.

Student 1: I completely agree. If we don't address this, it will impact our productivity.

Student 2: Why don't we talk to the IT department and see if they can help us get a faster modem? If we don't take action, our studies will be affected.

Student 1: That's a great idea! If we get a faster modem, we'll not only have a more efficient network for our studies, but it will also improve our overall online experience.