

Q1.
Devices are connected to networks.

(i) Give **two** reasons for connecting computers in a network. (2)

(ii) Describe **one** way a local area network (LAN) is different from a wide area network (WAN). (2)

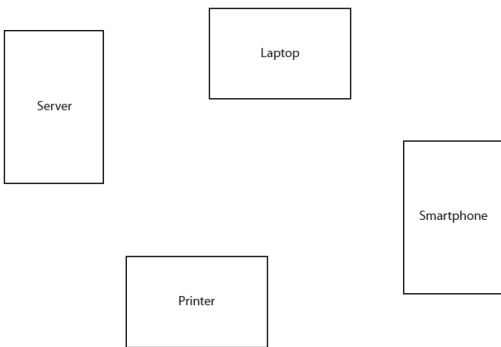
(iii) A network has a speed of 17.08 megabits per second.
Identify the equivalent speed in bits per second. (1)

A 17 080 **B** 17 080 000 **C** 17 080 000 000 **D** 17 080 000 000 000

(iv) Define the term 'latency'. (1)

Describe **one** disadvantage of using a bus topology. (2)

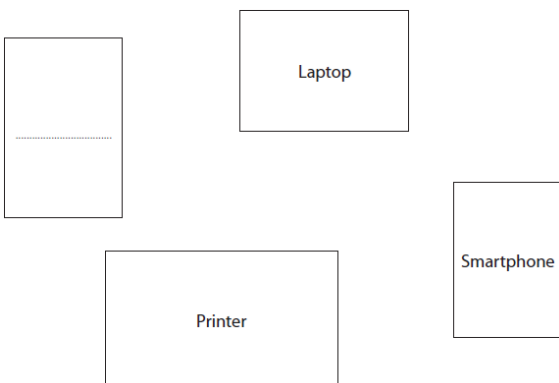
Q3.
Draw lines between these devices to show a fully-connected mesh network topology diagram: (2)



Explain **one** disadvantage of using a star network topology. (2)

Computers can be connected using a bus, mesh or star topology.

(i) Draw lines between the devices and label the unnamed device to show a star network topology diagram. (2)



(ii) Give **two** reasons for using a star topology rather than a bus topology. (2)

Q6.

A hotel chain has hotels in several countries and a head office in England.

State the type of network needed to connect these hotels to the head office. (1)

ANSWERS

- (i) Networks allow you to share **resources** such as printers, scanners, and copiers among multiple users. This shared access can save costs and improve efficiency.

Files can easily be shared between users on a network. Storing data centrally on a file server simplifies **backup** processes.

Network security can be managed centrally and updates can be done more quickly.

(ii) A LAN covers a small geographic area and is responsible for its own hardware and cabling. A WAN covers a wide geographical area and uses third-party hardware and cabling.

(iii) **B.** 1 megabit (Mbit) is equal to 1,000,000 bits. So, 17.08 megabits is equivalent to 17,080,000 bits

(iv) Latency refers to the time delay experienced when data travels from one device to another across a network.

Imagine it as the time it takes for a message to reach its destination after you hit “send.”

Low latency: A network with low latency experiences few delays in transmission.

High latency: A network with high latency encounters many delays in transmitting data.

Examples of Latency:

When you click a link on a web page, there’s a tiny delay before the new page loads. That’s latency. In online gaming, the delay between pressing a button and your character responding is also latency.

Factors Affecting Latency:

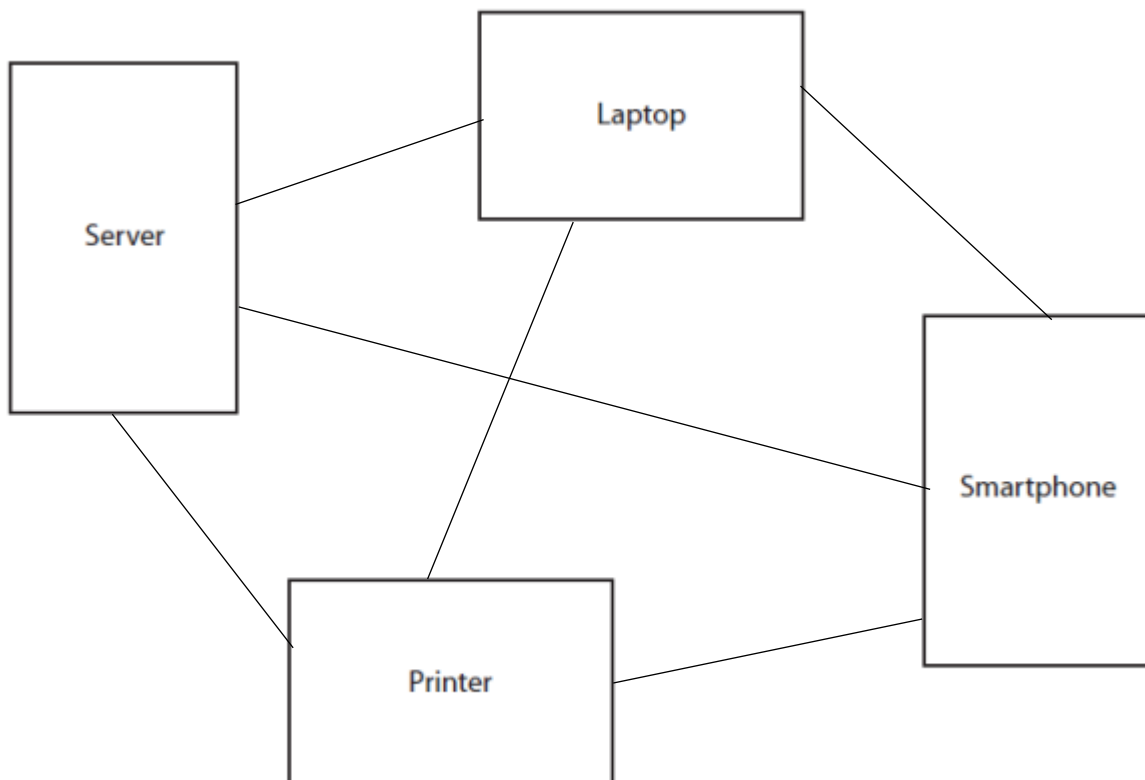
Distance: The farther data has to travel, the longer the latency.

Network Traffic: Busy networks with lots of data flowing can increase latency.

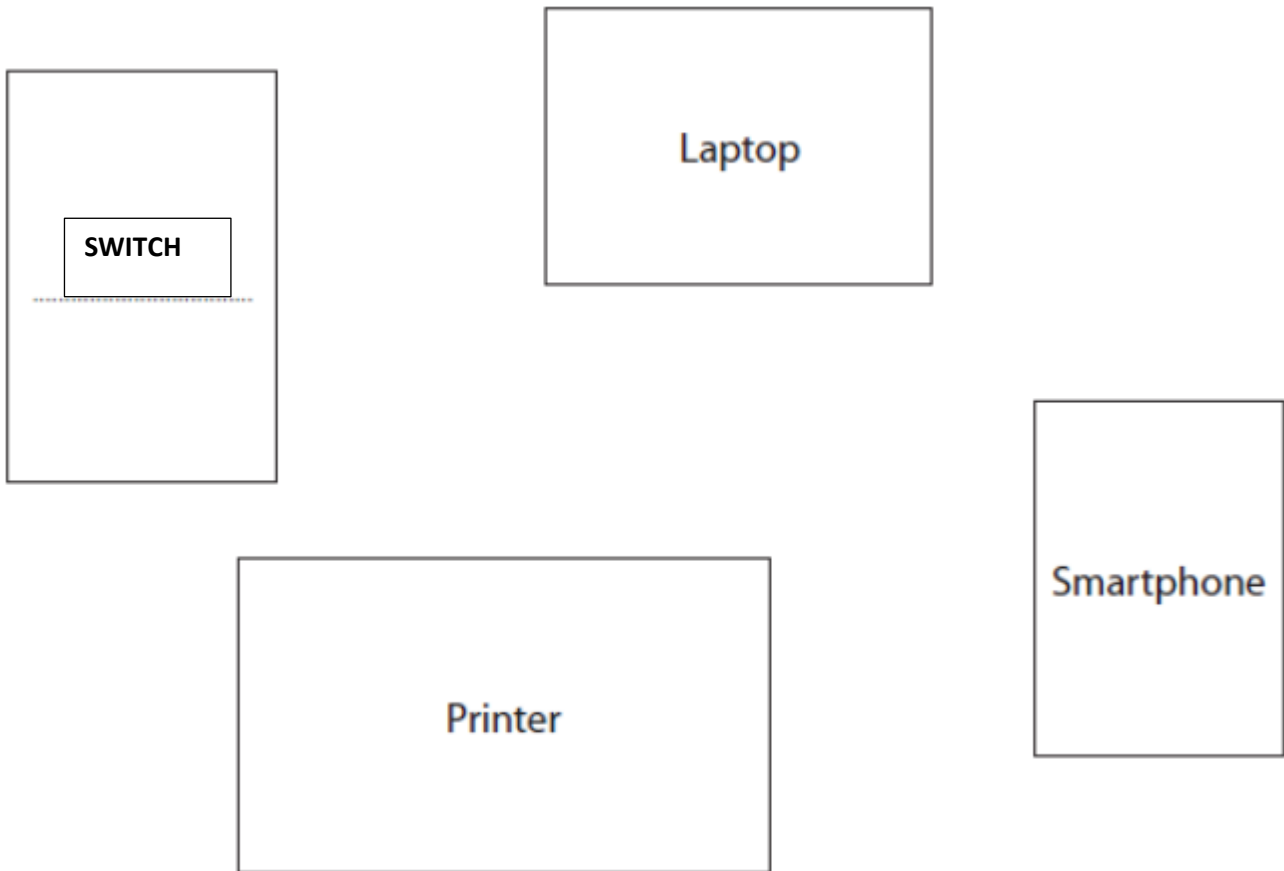
Transmission Medium: Different types of cables or wireless connections have varying latency.

Errors: If data packets get lost or need retransmission, it adds to latency.

- Disadvantages of a bus topology: limited for large networks because you can only add so many devices; the more devices the slower the network due to network congestion.
- Mesh topology



4. **Disadvantages of a star topology:** If the central switch fails, the entire network connected to it becomes inaccessible. It is more expensive than setting up a bus topology due to the increased amount of cabling and the need for switches. Harder to maintain as needs specialist knowledge.



5. **Better Reliability:** If one device on a star network breaks the rest of the network isn't affected (unless it is the switch that is affected.)
Easier to scale (add more devices).
Easier to troubleshoot and find errors because it is easier to isolate a part of a network.
6. To connect the hotels in different countries to the head office in England, a Wide Area Network (WAN) would be the most suitable type of network