

A-Level Computer Science

Name: _____ Score: _____

1. A network protocol is:

- ☐ a set of rules both devices follow so they can communicate
- ☐ a physical cable
- ☐ a type of computer
- ☐ a programming language

2. HTTPS is:

- ☐ HTTP over TLS — encrypted web traffic
- ☐ a faster version of FTP
- ☐ an email protocol
- ☐ a file format

3. In circuit switching:

- ☐ a dedicated path is reserved for the whole conversation
- ☐ data is split into independent packets
- ☐ each packet may take a different route
- ☐ there is no setup time

4. What does a protocol define? Select **all** that apply.

- ☐ the format of the data, including where the addresses sit
- ☐ the order of messages and when to acknowledge
- ☐ the timing, such as timeouts and retransmissions
- ☐ the speed of the physical cable

*Tick every correct option.*5. What does HTTPS add over plain HTTP? Select **all** that apply.

- ☐ the traffic is encrypted, so an eavesdropper sees only ciphertext
- ☐ the server proves its identity with a certificate
- ☐ tampering with the data in transit is detected
- ☐ pages are compressed so they download faster

Tick every correct option.

6. What is the main drawback of circuit switching?

- ☐ the reserved line sits idle during silences and nobody else may use it
- ☐ data can arrive out of order
- ☐ it needs sequence numbers
- ☐ the delay is unpredictable

7. A benefit of splitting networking into layers is:

- ☐ modularity — one layer can be replaced without changing the others
- ☐ it removes the need for protocols
- ☐ it makes the network slower on purpose
- ☐ it stores more data

8. The internet layer (IP) guarantees that every packet arrives.

- ☐ True ☐ False

9. IMAP leaves mail on the server and syncs it across all your devices, while POP3 typically downloads the mail and deletes it from the server.

- ☐ True ☐ False

10. Because each packet carries a sequence number, the destination can reassemble the message in the right order and re-request any missing packet.

- ☐ True ☐ False

1. **a set of rules both devices follow so they can communicate**

A protocol defines the format, order, meaning, timing and error handling of messages — both ends must agree.

2. **HTTP over TLS — encrypted web traffic**

HTTPS runs HTTP over TLS encryption (port 443), protecting the data in transit.

3. **a dedicated path is reserved for the whole conversation**

Circuit switching reserves one path end-to-end (reserved bandwidth) — but it wastes the line during silences.

4. **the format of the data, including where the addresses sit; the order of messages and when to acknowledge; the timing, such as timeouts and retransmissions**

Format, order, meaning, timing and error handling. The cable's speed is a property of the hardware, not of the agreement.

5. **the traffic is encrypted, so an eavesdropper sees only ciphertext; the server proves its identity with a certificate; tampering with the data in transit is detected**

TLS supplies confidentiality, authentication and integrity. Compression is a separate feature of HTTP itself.

6. **the reserved line sits idle during silences and nobody else may use it**

Reserving the path guarantees the rate and the order, and that is exactly what makes it wasteful. The other three describe packet switching.

7. **modularity — one layer can be replaced without changing the others**

Each layer has one job and a clear interface, so (e.g.) Ethernet can be swapped for Wi-Fi without touching higher layers.

8. **False**

IP forwards packets and does not guarantee delivery. Reliability is added above it, by TCP, and UDP deliberately does without it.

9. **True**

That is why IMAP shows the same inbox on your phone and laptop, whereas POP3 ties mail to one device.

10. **True**

Packets may arrive out of order or be lost; the sequence numbers (and TCP) put everything right.