14. Communication and internet technologies

Starter Quiz · 课前小测

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. 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

5. Which protocol is used to SEND email?

   ☐ SMTP

   ☐ HTTP

   ☐ FTP

   ☐ POP3

6. 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

7. 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

8. TCP is connection-oriented and guarantees ordered, complete delivery (with overhead), while UDP is fire-and-forget — faster but with no delivery guarantee.

   ☐ True ☐ False

9. A key advantage of packet switching is that it is:

   ☐ efficient (links shared) and robust (reroute around failures)

   ☐ always in order

   ☐ free of any latency

   ☐ simpler to set up a call

10. How does TCP differ from UDP?

    ☐ TCP is connection-oriented and guarantees ordered, complete delivery; UDP does not

    ☐ TCP is faster with no overhead

    ☐ UDP retransmits lost packets

    ☐ they are identical

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Answers · 答案

A-Level Computer Science

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. **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.

5. **SMTP**

   SMTP sends mail; POP3 and IMAP are used to receive/read it.

6. **True**

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

7. **True**

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

8. **True**

   That's why UDP suits live streaming, gaming and DNS, but TCP is used for files, email and secure web pages where every byte must arrive.

9. **efficient (links shared) and robust (reroute around failures)**

   Sharing links is efficient and rerouting makes it resilient. The trade-off is variable latency and possible loss (TCP fixes that).

10. **TCP is connection-oriented and guarantees ordered, complete delivery; UDP does not**

    TCP sets up a connection and ensures reliable, ordered delivery (with overhead); UDP is fire-and-forget.