

## COMPUTER SCIENCE TRIPOS Part IB – 2022 – Paper 5

### 2 Computer Networking (awm22)

A networking enthusiast says, “TCP does not perform well for the very long, the very short, the very fast, or the very slow.”

- (a) When and why are they correct? Explain your answer clearly. [8 marks]
- (b) QUIC is a new transport protocol that offers many advantages over TCP, it may not solve the issues the enthusiast of the last question discusses. Prototyping new protocols to replace TCP has proven difficult in the past. Discuss the QUIC approach to this particular challenge. [2 marks]
- (c) Considering the capacity and limits of end-system components (e.g., CPU(s), cache(s), main memory, peripheral interconnects, network adapters), propose a practical strategy for end-systems to deliver the next generation of Ethernet speeds (100Gbit/s and 400Gbit/s).

Alongside your strategy you may wish to also consider the particular challenges invoked by improved security in networking such as the wider use of IP header encryption (IPsec), the increasing use of full application-payload encryption, and so-forth.

Justify your approach by stating your assumptions throughout.

Hint: your approach need not be universal. It may help to consider aspects of Computer Architecture, Algorithms and Computer Networking in you approach. [10 marks]