## COMPUTER SCIENCE TRIPOS Part IB - 2023 - Paper 5

## 3 Computer Networking (awm22)

(a) (i) Ethernet switches use a spanning tree. Explain briefly what the aims of the spanning tree protocol are, and how it works to achieve these aims.
[6 marks]
(ii) Do the switches learn the entire network topology? Explain your answer.
(iii) Routers using link-state protocols communicate over the shortest path. Does each pair of switches communicate over the shortest path?
(iv) Routers may use a link-state protocol or a distance vector protocol. Compare the message-size complexity, computational complexity, and the robustness of these two approaches.
(b) The computer of another student on your college stairwell doesn't connect to the Internet.

They go on to say "...it's weird - my computer can talk with the printer in my room and my computer can see your computer, but I can't upload this essay due tonight, I can't connect to Google, and I can't even send an email..."

You suspect their computer is using automatically-allocated link-local addresses for both IPv4 and IPv6.

Speculate what has gone wrong to cause the computers to be using link-local addresses. You may want to consider: What address did the machine use? Why is the computer using link-local addresses? Why are some services are working but other services are not?

