COMPUTER SCIENCE TRIPOS Part IB – 2018 – Paper 5

5 Computer Networking (EK)

(*a*) Consider two clusters A and B each hosting multiple applications. All applications send bursty traffic between A and B over a link E. Under what conditions is circuit switching more efficient to use as opposed to packet switching? [2 marks]

(*b*) Compare the link state and distance-vector protocols in terms of message complexity, processing complexity and robustness. [6 marks]

(*c*) Cambridge University is about to open a new School with three new departments A, B and C. The IPv4 address prefix of the new School is 128.232.1.0/24 and it is expecting each department to have the following number of hosts:

Department A:	between 40 and 60 hosts
Department B:	between 100 and 120 hosts
Department C:	between 20 and 30 hosts

(*i*) The university wishes to allocate a subnet for each department. Give possible IPv4 subnet masks for each new department. [3 marks]

(*ii*) Later, the School opens a fourth department D with 30 hosts. Provide possible IPv4 subnet masks to accommodate all four departments. [2 marks]

(*iii*) Finally, the School opens a fifth department E of similar size to B. Provide possible IPv4 subnet masks to accommodate all five departments. [4 marks]

(*iv*) Are there any practical problems with your answer to Part (*c*)(*iii*)? Briefly discuss an alternative solution to accommodate all five departments. [3 marks]