COMPUTER SCIENCE TRIPOS Part IB – 2014 – Paper 5

4 Computer Networking (AWM)

(*a*) What is the difference between routing and forwarding? [2 marks]

(*b*) Routing algorithms can be either *link-state* or *distance-vector*. Define these two terms and explain the trade-offs between them. [6 marks]

(*c*) You are required to design a topology discovery protocol for a network of switching nodes interconnected by links. There are n nodes, l links, the maximum degree of any node is k and there is a path between any two nodes of not more than d hops. All links are bi-directional.

Each node has a unique identifier of four bytes which it knows.

(*i*) Describe a protocol for a node to learn about its immediate neighbours. You should specify the format of your messages and the size of any message fields. [4 marks]

(*ii*) Using the characteristics of the network described above, design a protocol for distributing this information across the network. You should specify the format of your messages and the size of any message fields. [8 marks]