UNIVERSITY OF EDINBURGH

FACULTY OF SCIENCE AND ENGINEERING

COMPUTER SCIENCE FOUR

COMPUTER NETWORKING

Thursday 27 April 2000

4:00 to 5:30

Examiners:

Prof. K. Turner (External)

Prof. G. Brebner (Chairman)

INSTRUCTIONS TO CANDIDATES

Answer any TWO questions.

All questions carry equal weight.

1. (a) Compare and contrast the operation and use of the IEEE 802.3 ethernet-style wired LAN and the IEEE 802.11 wireless LAN. [*10 marks*]

   (b) Consider an inter-network constructed entirely from IEEE 802.3 and 802.11 type LANs. Discuss the use of TCP/IP for providing an end-to-end connection-oriented service in this environment, and comment on how a simplified, more specialised, protocol might be designed for this task. [*7 marks*]

   (c) Outline how you envisage the respective use of wired and wireless networking to evolve over the next 10 years, taking into account likely changes in the dispersion and use of computers. [*8 marks*]

2. (a) Describe the format of the Asynchronous Transfer Mode (ATM) cell, explaining how its components are related to the basic ATM cell transmission service. [*7 marks*]

   (b) Differentiate between the Continuous, Variable, Available and Unspecified Bit Rate ATM service types, indicating for each type: (i) what applications it is apt to support; and (ii) what quality of service it would require from the basic cell transmission service. [*8 marks*]

   (c) Discuss the present-day position, and likely future position, of ATM in computer networking, in particular ATM's relevance to the Internet. [*10 marks*]

3. (a) Suppose that a regional health board has responsibility for several hospitals, a collection of general practitioner (family doctor) surgeries and a mobile para-medic/ambulance service. There is a plan to introduce centralised management for all of the computer networks involved in providing its various services. Discuss the network management facilities that might be appropriate for implementing this plan, commenting on any problems that you foresee, and stating any assumptions you make about the computers and the networking that may be involved. [*17 marks*]

   (b) Briefly discuss the security problems that are likely to be of concern to the health board, and comment on the solutions that could be incorporated into its networking facilities. [*8 marks*]