UNIVERSITY OF EDINBURGH

FACULTY OF SCIENCE AND ENGINEERING

DIVISION OF INFORMATICS

Computer Literacy 1h

Degree Examination

Date: Friday, 31 May 2002
Time: 14:00 – 15:30

Board of Examiners
Chair: D. K. Arvind
External Examiner: R. Dyckhoff

Instructions to Candidates

Attempt **ALL** questions in part 'A' and **ONE** question from part 'B'

Marks for questions are indicated in brackets after each question and the total for the exam is 70.

Candidates in the third or later year of study for the degrees of MA(General), BA(Relig Stud), BD, BCom, BSc(Social Science), BSc(Science) and BEng should put a tick (➤) in the box on the front cover of the script book.

Part "A"

Answer ALL questions from this section

1. **(a)** For most purposes the prefix "K" (Kilo-) means 1,000. When used in I.T. it means 1,024. Why? [2 marks]

   (b) I bought a 2 GHz processor this year. Assuming processor speeds obey Moore's law, show approximately what speed of machine I am likely to replace it with in 2005/6. [2 marks]

   (c) My machine contains a 60 Gb, 7200 rpm 3.5" IDE hard disk. Explain the significance of the terms in this description. [2 marks]

   (d) When would you use a Revision Control System and what kind of problem would it prevent? [2 marks]

   (e) Describe what you understand by the term 'layered' when applied to software. [2 marks]

2. **(a)** Describe some of the functions and capabilities of a Database Management System (DBMS). [4 marks]

   (b) Describe three things that have to be simulated to produce a realistic computer graphic representation of a real-world scene. [3 marks]

   (c) Describe three features you would expect of a well-constructed software application. [3 marks]

3. **(a)** Describe some of the physical problems people can experience when using computers for long periods and how these may be alleviated. [4 marks]

   (b) Describe some of the ways in which the services offered by an Internet Service Provider can be abused. Choose one and describe how the problem can be made less severe. [4 marks]

   (c) Why do you *defragment* a disk? [2 marks]

4. **(a)** Outline in pseudocode the steps in an algorithm describing making a telephone call where the receiver has an answering machine. [3 marks]

(b) List one characteristic for each of the so-called 1st, 2nd, 3rd and 4th generations of programming languages. [4 marks]

(c) Illustrate Selection Sort on the following set of numbers. Show the set after each change with the final sorted set having the smallest value on the left and the largest on the right.

17 20 11 31 9 19 [3 marks]

5. **(a)** Explain why it is necessary to control the rate of flow of information between two computers. [2 marks]

(b) Explain unicast, broadcast and multicast. [2 marks]

(c) Why is packet-switching important? [2 marks]

(d) What is Gigabit Ethernet? [2 marks]

(e) Explain why carelessness can be extremely costly in the age of web-based publishing in ways never experienced when publishing conventionally. [2 marks]

Part "B"

Answer ONE question only from this section

B1. The managing director of a small company making self-assembly furniture believes that changes in all areas are necessary to keep the product competitive. He needs to work out and write proposals then present them to the company Board to convince them to authorise the necessary action. Consider how such an idea might progress from initial idea to finished presentation and describe **all** the areas you can think of in which IT is used to develop the proposal. The company buys materials from several suppliers and all areas of the company will be affected – design, supply, manufacturing, distribution, finance, advertising, people and organisation. Opinions will need to be sought from key people. Money will have to be spent on equipment and possibly a loan arranged with the bank (and paid off over an agreed period). [20 marks]

B2. A friend runs a small publishing/artwork business (pamphlets and so on) with four or five Windows 98 systems and associated printers etc. on an office LAN, connecting to the outside world via ISDN into one machine. The machines were bought in 1999 and have been fine for the purpose so far (a little slow maybe) and are used heavily but no-one has touched the systems since they were installed by the supplier. She asks you if you could do a 'health check' on the systems, fix, advise and update them as necessary then come in monthly to perform system maintenance. What would you look for (and if necessary, repair) in your 'health check' and what would you do on a monthly basis once you were happy with the state of the systems? Money can be found if it is necessary to buy anything. [20 marks]

B3. As a home computer user you may be faced with choosing between a variety of network service options. Explain what this means and discuss the issues and considerations that may play a part in your choice. [20 marks]

B4. "Wireless networking links the fridge, the foyer (hotel) and the forest." Explain what this means in terms of the social and technological possibilities of wireless networking. [20 marks]