

UNIVERSITY OF EDINBURGH

COLLEGE OF SCIENCE AND ENGINEERING

Computer Literacy 1h

Degree Examination

Date: Friday, 28 May 2004

Time: 14:30 – 16:00 (one and a half hours)

Place: Appleton Tower Concourse

Board of Examiners

Chair: M.R. Jerrum

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. Each question in part 'A' is worth ELEVEN marks and the total for the exam is 75.

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) i. What are the principal differences between the *raster* and *vector* representations of a graphical object? [2 marks]
ii. What is *antialiasing* ? [1 mark]
 - (b) What do you understand by the term
i. Mainframe? [1 mark]
ii. Server? [1 mark]
 - (c) The Apple iPod portable music player contains an 80Gb hard disk. Roughly how many 3 minute MP3 tracks would I expect to be able to store on it? Show your working and assumptions. [2 marks]
 - (d) What is being described in the HTML statement
`<body bgcolor="#FF8080">` ? [2 marks]
 - (e) Why is it normally inadvisable to halt a PC by switching the power off at the wall? [2 marks]
-
2. (a) In what ways has the Internet affected business processes and products? Give examples where appropriate. [4 marks]
 - (b) Describe some causes of *failure* in computer systems. What do we mean by software failures and how can these be avoided? [4 marks]
 - (c) i. What are the principal functions of a Database Management System (DBMS) ? [2 marks]
ii. Give an example of a question that might be answered by a Geographical Information System (GIS) ? [1 mark]

3. (a) Describe some functions of an *operating system*. [4 marks]
- (b) Describe some of the benefits and problems likely to be encountered in using the various forms of groupware (videoconferencing, chat etc.) as opposed to real-world meetings. [4 marks]
- (c) Compare and contrast what is meant by the terms RAM, CD-ROM and Hard Disk. [3 marks]
4. (a) How do computers contribute to the spread of identity theft? [2 marks]
- (b) How does a computer become infected with a virus? [2 marks]
- (c) What steps can be taken to avoid computer virus infection? [2 marks]
- (d) Explain why encryption is necessary in computer communication? [2 marks]
- (e) How do protocols and standards contribute to the expansion of communication? [3 marks]
5. (a) Study of sorting algorithms and the Tower of Hanoi problem illustrates the importance of finding a good algorithm and understanding complexity and scaling. Explain how these considerations arise in the following:
- i. Detection of plagiarism
 - ii. Bank and airport security
 - iii. Secure message transfer [4 marks]
- (b) Why should we be worried about our details being recorded in computer databases? [3 marks]
- (c) Give two examples of why parents should be concerned about the influence of computers and the Internet on their children. [2 marks]
- (d) What is the Communications and Multimedia Act (1998) ? [2 marks]

Part "B"

Answer ONE question only from this section

- B1.** The UK Government is considering introducing a national ID card within the next few years. IT will clearly be a key factor in making the scheme work. Discuss the likely benefits and dangers of an IT-based ID card and some of the technical, ethical and legal problems and issues likely to be encountered as the card is introduced. [20 marks]
- B2.** Consider your typical morning from waking up till you reach the University. Describe how you think Information Technology has shaped or maintains the products and services you would encounter in the first couple of hours of a normal day. [20 marks]
- B3. (a)** Describe some key elements of each of the three following networks that allow two users to communicate. You may use diagrams.
- i.** The Internet
 - ii.** The fixed telephone network
 - iii.** A mobile phone network
- [10 marks]
- (b)** Outline how the digital revolution means that these networks are now overlapping and linked in providing services. [10 marks]
- B4. (a)** Computing in the home may now involve many computers and many different functions and services. Briefly describe what can be provided and how it is provided. [10 marks]
- (b)** Outside the home mobile computing continues to grow. Explain what this means in terms of standalone and networking capability and how it is provided. [10 marks]