

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
General Certificate of Education  
Advanced Subsidiary Level and Advanced Level

**COMPUTING**

**9691/01**

Paper 1

May/June 2004

**2 hours**

Additional Materials: Answer Booklet/Paper

**READ THESE INSTRUCTIONS FIRST**

If you have been given an Answer Booklet, follow the instructions on the front cover of the Booklet.  
Write in dark blue or black pen on both sides of the paper.  
You may use a soft pencil for any diagrams, graphs, music or rough working.  
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions.

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [ ] at the end of each question or part question.

This document consists of **4** printed pages.



- 1 (a) State what is meant by
- (i) operating system software; [1]
  - (ii) applications software. [1]
- (b) Explain the difference between
- (i) batch processing and real-time modes of computer system use; [2]
  - (ii) on-line processing and off-line processing. [2]
- (c) A computer game involves steering a car around a course. State which **two** of the terms: batch, real-time, on-line and off-line would be needed for this example, justifying your choice. [3]
- 2 (a) Explain the meaning of the term *utility* software. [2]
- (b) Describe **two** examples of utility software. [4]
- 3 (a) State the meaning of the following types of testing.
- (i) White box testing.
  - (ii) Black box testing.
  - (iii) Alpha testing.
  - (iv) Beta testing. [4]
- (b) Explain what is meant by the following types of programming error. Give an example in each case.
- (i) Syntax.
  - (ii) Logic.
  - (iii) Arithmetic. [6]
- (c) A program has been written using a top-down technique. The individual modules in the program have been fully tested and there are no errors in any of them. Explain why the program may fail to run or may produce incorrect results, despite the testing that has been done. [2]

- 4 (a) (i) Explain what is meant by the character set of a computer. [1]
- (ii) Describe how the character set is represented in the computer system. [2]
- (b) A stock file in a warehouse has the following fields in each record.
- Name of item.
  - Date of last delivery.
  - Price of item.
  - Whether or not an order is outstanding.
  - Number of that item left in stock.
- (i) State data types suitable for each of the fields. [5]
- (ii) Given that there are approximately 10000 different items in the warehouse, estimate the size of the stock file. You should clearly show all the stages in the calculation. [5]
- 5 (a) Explain the meaning of the following modes of data transmission.
- (i) Simplex.
- (ii) Duplex.
- (iii) Half-duplex. [3]
- (b) (i) Describe how buffers and interrupts are used in the transfer of data from primary memory to secondary storage. [5]
- (ii) State which of the modes of data transmission would be most suitable for the procedure in (i), justifying your answer. [2]

**The following questions refer to this information.**

A manufacturing company uses computer systems to store details of customers, suppliers and employees.

The employee file contains details of all employees including their name, address, rate of pay, tax rate and other details.

- 6** Much of the information in the employee file is personal and should remain confidential.
- (a) Describe measures that can be taken to persuade workers that their personal information remains as confidential as possible. **[3]**
- (b) Describe the health and safety issues affecting those workers who need to work with the computer systems, and how to overcome them. **[6]**
- 7** Each employee record contains a picture of the employee.  
Explain how an image can be captured and then stored on the employee file. **[4]**

The company decides to investigate the use of computer systems to automate the production line.

- 8** A systems analyst is hired to carry out a feasibility study.  
Describe **four** areas that the systems analyst should report about in the feasibility study. **[8]**
- 9** The present computer system runs a set of integrated software packages.
- (a) Communication with the user is via a human computer interface (HCI).  
Discuss the importance of
- (i) colour;
- (ii) layout;
- (iii) content
- in the design of the HCI. **[9]**
- (b) Software will be necessary to run the new automated production line.  
Explain why custom written software is appropriate to this application. **[2]**
- 10** Information from the files is used by the management to inform their decisions.
- (a) Identify **two** types (or levels) of information that a management information system (MIS) can produce. **[2]**
- (b) State **three** output formats that can be used to present information to a manager, giving an advantage of each. **[6]**