



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

COMPUTING

9691/01

Paper 1

October/November 2007

2 hours 30 minutes

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 your Centre number, candidate number and name on all the work you hand in.

Write in dark blue or black pen.

You may use a soft pencil for any diagrams, graphs 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) (i) Describe a GUI (Graphical User Interface). [2]
- (ii) Describe a form-based computer interface. [2]
- (b) (i) State a computer application for which a GUI would be suitable. Justify your answer. [2]
- (ii) State a computer application for which a form-based interface would be suitable. Justify your choice. [2]
- (c) A computerised information system is set up in a busy town centre. The system gives details of transport, shops, sales of goods, places to eat and hotels. Describe the hardware and the software of the HCI (Human Computer Interface) giving reasons for your answers. [4]
- 2 A variety of goods are stored in a warehouse. All goods enter and leave the warehouse at a specific point. All goods are bar coded.
- (a) The number of each item in the warehouse is stored as a binary number. Change 83 into a binary number stored in an 8 bit byte. [2]
- (b) The warehouse uses stock control software. Explain how this software maintains stock levels in the warehouse. [5]
- 3 (a) State **one** difference between random access memory (RAM) and read only memory (ROM). [1]
- (b) State **three** types of data stored in RAM. [3]
- (c) An embedded processor contains all the software needed to control an automatic washing machine.
- (i) State why the software is stored on ROM. [1]
- (ii) Explain why it is important that ROM has some of the characteristics of RAM. [2]
- 4 (a) Give **four** points that need to be considered when a systems analyst produces a feasibility study. [4]
- (b) Describe what is involved in the analysis stage of the systems development life cycle. [6]
- 5 Explain why personal data, held about members of the public on computer systems, needs to be protected. State measures which can be used to protect this data. [6]

6 A washing machine is computer controlled.

The full cycle consists of

- Check the door is shut
- Heat water with heater (H) to 80 degrees if hot wash has been selected, 40 degrees if a cool wash has been selected
- Run wash motor (M) for 20 minutes, checking water every 5 minutes to see if heater (H) should be turned on again
- Sound buzzer to signify that wash cycle is complete.

Note: M can be set to “on” or “off”.

Write an algorithm, in whatever form, to show the working of the washing machine. [7]

The remaining questions refer to the following information.

A company specialises in surveying land for oil companies.

Part of their work involves using radar and other scientific procedures to search underground for likely oil-bearing formations. The results of the surveys are stored numerically, ready for processing.

7 Data collected during the search is input to a knowledge based (expert) system.

(a) Describe **three** parts of a knowledge based system. [6]

(b) Explain how this knowledge based system was set up and how it is used. [5]

8 Data collected at the survey site is sent, electronically, to the head office of the company for processing.

(a) Describe the hardware necessary to enable this communication. [3]

(b) (i) The results of the analysis of the data are often output on a plotter.
Give **two** advantages of outputting this data to a plotter. [2]

(ii) Apart from the output to the plotter, the system produces many other output formats.
State **two** forms of output which would be produced by this application and explain why each is appropriate. [4]

9 (a) Describe what is meant by taking

(i) a backup of data, [2]

(ii) an archive of data. [2]

(b) The data collected by the survey teams and the results of the processing are both backed up and archived.

(i) Explain why it would be important to take a back up of the results of a survey. [2]

(ii) Explain why it would be important to archive the results of a survey. [2]

- 10 (a)** Much of the processing of the data is carried out using a spreadsheet.
Explain why the features of spreadsheet software would be useful for processing this data. [3]
- (b)** The results of surveys carried out must be presented to the oil company that has commissioned them. This is normally done at a special meeting with the managers of the company.
Explain the features of presentation software which make it appropriate for use in this situation. [2]
- 11** The data which is transmitted between survey sites and head office is liable to errors. Data which is received is checked for errors.
- (a)** One method of checking for errors is to use parity checks.
The following four bytes have been received:
- 01101001 10111100 10101010 00100100
- (i)** One of the bytes contains an error. State which byte. [1]
- (ii)** Explain your choice of answer in **(i)**. [2]
- (iii)** Explain why a byte may still be in error even if it passes the parity test. [1]
- (b)** A second method of checking for errors is to use check sums.
Explain how check sums are used to check data for transmission errors. [4]