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

COMPUTING **9691/01**

Paper 1

May/June 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.

UNIVERSITY of CAMBRIDGE
International Examinations

[Turn over

1 A student uses her home computer to:

- play games which she gets from a library;
- finish work that she brings home after starting it at school;
- produce a finished copy of the work to hand in to her teacher;
- communicate with her friends.

State the peripheral devices, apart from keyboard, mouse and monitor, which she would need. Explain why each would be necessary. [8]

2 Speed mismatch is a problem that arises with the use of computer systems.

(a) Describe what is meant by the speed mismatch between user, peripheral and processor. [2]

(b) Identify an application which would use batch processing. [1]

(c) Explain how batch processing can overcome problems caused by speed mismatch. [2]

3 A systems analyst is commissioned by a company to produce a computerised system in its offices.

(a) Explain why it is important to define the problem accurately. [2]

(b) The analyst needs to collect information about the current system.
State **two** methods which the analyst can use to collect information and give an advantage of each. [4]

(c) State the importance to

(i) the end user

(ii) the systems analyst

of evaluating the system against the initial specification. [2]

(d) Explain why systems development should be regarded as an iterative process. [2]

4 One purpose of most operating systems is to provide a set of utility programs designed to perform common tasks.

(a) (i) Describe the purpose of a disk formatting utility. [2]

(ii) Describe the purpose of a virus checking utility. [2]

(b) Describe **two** other purposes of an operating system apart from providing utility programs. [4]

5 (a) Describe what is meant by verification of data. [2]

(b) Give an example of an application which would require the data input to be verified and explain why it would be necessary. [2]

6   D=1
       INPUT X, E
       B=E
       C=E
          FOR   I = 1 TO (X-1)
             INPUT A
             IF A>B   THEN B = A
                   ELSE   IF A < C   THEN C = A
                                 END IF
             END IF
             D = D + 1
             E = E + A
          NEXT
       F = E/D
       OUTPUT   B, C, F
       END

   (a) State the output values of B, C and F for the following input test data

              4, 6, 3, 7, 0   [3]

   (b) Give **three** other different sets of test data, explaining what condition each is meant to test.[3]

7   Access to the Internet is now available to anyone with a computer, anywhere in the world.
       Discuss the social and ethical effects that access to the Internet can have.   [7]

The remaining questions refer to the following information.

A garage sells cars and also has servicing and parts departments.
Details of customers who purchase cars are stored in a file.
Details of cars for sale are stored in another file.

8   The data in the car file is stored in fixed length records.

   (a) Explain the relationship between files, fields and records, using examples from the car file. [3]

   (b) Explain what is meant by fixed length records.   [2]

   (c) The data held about each car includes:
              • Colour,
              • Size of engine,
              • Whether or not it has air conditioning,
              • Price.
       State a suitable data type for each of the items of data listed.   [4]

9 (a) (i) State what is meant by an integrated (common) software package. [2]

(ii) Give two reasons why an integrated software package would be used in the garage.

(b) The servicing department sends letters to all customers who have bought cars from the garage. The letters remind customers that their car needs a service. The letters are sent, each year, on the date that the customer bought their car.

Explain how the software is used to create a personalised letter for each customer. [5]

Some computers are used in the offices for clerical tasks like word processing and accounting. Some are in the showroom so that customers can see details of cars and videos of them being driven. The computers used at the garage are networked and all data is stored on a central server.

10 (a) State a difference between a local area network (LAN) and a wide area network (WAN). [1]

(b) (i) Use examples from this application to explain the relationship between bit rates and the way that the data in the files is used. [4]

(ii) The human computer interface (HCI) used on the computers in the showroom is menu-based.
Describe the interface that customers will use. [3]

(c) State two health and safety issues that may arise due to the use of the computers.
Give a different solution for each of the two issues which you have mentioned. [4]

11 Explain how the pictures and video sequences used on the network can be collected and transmitted to the computers in the showroom. [5]

12 The parts department keep details of parts on a random access file which is accessed by means of a hashing algorithm.

(a) Explain the difference between an indexed sequential file and a random access file. [2]

(b) Each part, stored by the parts department, has a 6 digit key.
- The first two digits refer to the model of the car for which it is designed.
- The third digit is used to indicate the year of manufacture.
- The last three digits are used to ensure the key for this part is unique.

(i) Devise a hashing algorithm which would be suitable for storing 10,000 parts. [2]

(ii) State two key values which hash to the same address. [1]

(iii) Describe a method of handling collisions when using a hashing algorithm. [2]