CAMBRIDGE INTERNATIONAL EXAMINATIONS
Cambridge Diploma in Computing
Advanced Level

DIPLOMA IN COMPUTING **5216**

Module 1

October/November 2003

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

UNIVERSITY of CAMBRIDGE
Local Examinations Syndicate

[Turn over

1 **(a)** The person responsible for the computer system in a college buys an integrated applications package made up of generic software.

Explain what is meant by

(i) *integrated software,*

(ii) an *applications package,*

(iii) *generic software.* **[3]**

(b) **(i)** Explain the difference between batch processing and real-time processing.

(ii) For each mode of processing give an example of a computer application for which it would be appropriate. In each case justify your choice. **[6]**

2 Describe the following types of user interface. For each type of interface give a suitable use, justifying your answer in each case.

(i) Form-based.

(ii) Graphical User Interface (GUI).

(iii) Command line. **[9]**

3
```
TOTAL = 10
REPEAT
    READ K
    IF K >= 2    THEN
       TOTAL = TOTAL + K
    ELSE
        K= K* K
        TOTAL = TOTAL + K
    ENDIF
    PRINT TOTAL
UNTIL K= 2
PRINT TOTAL
END
```

Write down the output produced by this code with the following input string

3, 5, 1, 2, 4, 0 **[5]**

4 Describe **three** different methods that can be used, by a programmer, to make code more understandable to someone who has to maintain it. **[6]**

5 Details of students in a college are stored in a computer system. Among data items stored are

- the student's name
- the student's address
- the student's date of birth
- the mark obtained in the last mathematics examination
- whether or not the student wants to go on a college trip
- how much the student owes towards the cost of the trip.

(a) The name and address are stored as ASCII characters. Explain what is meant by an *ASCII character.* **[2]**

(b) State data types that are suitable for each of the other pieces of data. **[4]**

(c) Using this example, explain what is meant by each of the following terms.

(i) Field.

(ii) File.

(iii) Record. **[3]**

6 Explain how buffers and interrupts are used when data is being moved from main memory to a secondary storage device. **[6]**

7 A college has a number of stand-alone machines. The decision is taken to turn them into a LAN.

(a) State **two** items of hardware and **one** of software which will be necessary for the conversion. **[3]**

(b) Explain why students find that access to text based files does not cause a problem, while graphics files download very slowly. **[2]**

(c) State **two** advantages and **two** disadvantages of the college converting to a network system. **[4]**

(d) **(i)** Explain why a protocol is needed for this network.

(ii) Give a reason why such a protocol should be arranged in a layered fashion. **[4]**

The remaining questions refer to the following information.

A large chemical plant is controlled automatically from a central control room. One process is to mix two chemicals at a specific temperature and pressure. The process is to be computer controlled.

8 The software to do this can be custom-written or off-the-shelf.

(i) Explain the terms *custom-written* and *off-the-shelf*. **[2]**

(ii) State which is the more appropriate in this case, giving a reason for your answer. **[2]**

9 Information about the state of chemical processes in the plant is conveyed to the control room.

(a) Distinguish between passive and interactive information systems and choose one for this example, justifying your answer. **[4]**

(b) Human Computer Interaction (HCI) is very important in such an application.

(i) State what is meant by HCI. **[1]**

(ii) Discuss the issues which are of particular importance when designing the HCI for this application. **[5]**

The administration of the chemical plant is computerised, including the storage of personnel records, the processing of the payroll and the communications with clients and suppliers. The present system is old, having been introduced when the plant was built. It is to be replaced by a new computer system.

10 Describe **three** different methods of implementing the new system. **[9]**

11 Workers at the plant register when they arrive for work by placing a card in a machine (clocking on) and repeating the process when leaving (clocking off). This machine is not connected to a computer. These cards are then used as input to the payroll program. The data on the cards comprises a bar code and OCR data. Describe how these two types of data are read by the computer and state what they are used for in this application. **[6]**

12 Discuss how the jobs of the workers in the administration section will be affected by the introduction of the new system. **[4]**

[Total: 90]