COMPUTING 　　　　　　　　　　　　　　　　　**9691/13**

Paper 1 　　　　　　　　　　　　　　　　**October/November 2010**

　　　　　　　　　　　　　　　　　　　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   Describe the purpose of the following types of utility software:

    (a) disk formatting [2]

    (b) file compression [2]

    (c) hardware drivers [2]

    (d) file handling [2]

2   **(a)** **(i)** Describe what is meant by source code. [2]

        (ii) Describe what is meant by object code. [2]

    (b) State what is meant by the following types of programming error:

        (i) syntax error [1]

        (ii) logic error [1]

    (c) Explain what is meant by:

        (i) black box testing [2]

        (ii) beta testing [2]

3   **(a)** A shop's stock control system stores data about the goods in the shop.

    For each of the following data items, state the most suitable data type. Justify your choice.

        (i) Bar code number [2]

        (ii) Price in dollars [2]

        (iii) Whether on order or not [2]

    (b) Using the example of the shop stock control system, explain how fields, files and records are related. [3]

4   Describe the need for the following components of an expert system, used in medical diagnosis.

    (a) HCI [2]

    (b) Inference engine [2]

5   A school has a file of student data.

    Describe how mail merge software can produce letters about a school trip for all the students who are taught geography by Ms Ahmed. [6]

6 (a) State **two** items of hardware and **one** item of software used to create a local area network (LAN) with a number of computers. [3]

(b) Draw a labelled diagram to show a bus network topology. [3]

(c) When data is transmitted around a network it is possible that the data becomes corrupted. Explain how check sums can be used to detect such transmission errors. [4]

7 An algorithm is to be created to calculate the pay for the workers in a factory.

The name of each worker is input with the number of hours worked that week. Workers are paid in Lienes and cents, a Liene being local currency.

100 cents = 1 Liene

Each worker is paid 2.85 Lienes per hour. If a worker earns more than 80 Lienes in a week they must pay 20% of anything over 80 Lienes in tax. Their pay is then reduced by that amount.

Produce an algorithm for the software which will output for each worker: their name; their pay for the week; the tax they must pay.

The algorithm will continue to calculate the pay of workers until the value 'xxx' is input as the worker's name.

The number of workers should be output at the end of the algorithm. [10]

The remaining questions refer to the following information.

A farmer has a large herd of dairy cows. The cows are milked twice a day. During the time that they are being milked each cow is given some extra food to supplement what they eat in the fields. Each cow needs a different amount and type of extra food.

A systems analyst is employed to oversee the computerisation of the feeding system.

8   For the new system it will be necessary to produce documentation.

State the purpose of each of the following types of documentation and give an example of the content of each.

(i)   Requirements specification [2]

(ii) Technical manual [2]

(iii) User manual [2]

The new system has been introduced to the farm.

9   When a cow is connected to the milking machinery, the system needs to know which cow it is. This will allow the system to ensure that the correct food is given.

Each cow has a 6-digit identity number.

(a) Describe how the identity number of the cow can be read automatically by the system. [2]

(b) Describe **three** different methods of validation that can be carried out on the identity number. [6]

10 State **three** different types of output format for the farmer from this feeding system. Justify your answers. [6]

11 When the farmer wishes to change the food given to a cow, a terminal in the cow shed is used. A menu-based HCI is used to input the new data.

(a) State **two** hardware peripherals used for the HCI. Justify your answers. [4]

(b) Describe a menu-based HCI and explain why it would be used in this case. [4]

12 Before the new system was introduced, the farmer employed three people to look after the herd.

Describe the effects that the new system will have had on the three employees. [5]