CAMBRIDGE INTERNATIONAL EXAMINATIONS
Cambridge Diploma in Computing
Advanced Level

DIPLOMA IN COMPUTING

Module 3

5218/01

May/June 2003

2 hours

Additional Materials: Answer Booklet/Paper

READ THESE INSTRUCTIONS FIRST

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.
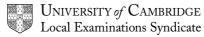Do not use staples, paper clips, highlighters, glue or correction fluid.

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.

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Local Examinations Syndicate

[Turn over

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1 **(a)** If a sequence of high level language instructions is inside a loop and that loop will be executed 2000 times, explain why using an interpreter to run this sequence will be slower than running a compiled version. **[2]**

(b) Using examples, explain what happens during the lexical analysis stage of compilation. **[4]**

2 The data Nile, Zambesi, Amazon, Indus, Thames, Volga, Danube and Mississippi are to be entered into a binary tree in that order so that later these names can be extracted in alphabetical order.

(a) Draw the representation of the binary tree with this data held in it. **[3]**

(b) Describe how to insert a new value correctly into this tree. **[4]**

3 Data security and privacy are major problems in using wide area networks. Describe methods that can be used to minimise these problems. **[9]**

4 The next instruction to be carried out is

LDAN 25

which loads the number 25 into the accumulator.

With reference to the special registers in a processor, describe the stages of the fetch-execute cycle when dealing with this instruction. **[6]**

5 **(a)** Describe **three** characteristics of an object-orientated approach to problem solving. **[6]**

(b) In object-orientated programming, state what is meant by

(i) class,

(ii) subclass,

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

6 **(a)** Explain what is meant by the term protocol. **[2]**

(b) Explain the measures that can be used to standardise communication between computers. **[6]**

(c) A company has a number of offices around the world. Describe ways in which computers can be used to aid communication between the company's offices. **[8]**

7 One reason for using a simulation would be to save the cost of producing the real thing. State **three** other reasons for producing a simulation. In each case give an example of a situation where your reason would be important to the decision to produce the simulation and explain why the simulation would be preferable to the real thing. **[9]**

8 When a new computer solution is to be implemented there are a number of choices for the type of implementation to be used.

Describe each of the following types of implementation

    (i) parallel running,

   (ii) phased introduction,

  (iii) pilot introduction,

ensuring that you make a clear distinction between them. For each type of implementation give an example of a situation where its use would be sensible, explaining why. **[9]**

9 Describe what happens when a processor which is currently working on a job receives an interrupt from an external source. **[6]**

10 A sports club runs a number of sports teams.

Each team is made up of a number of members of the club and each member may play for more than one team. Each team has a number of coaches, but the coach's job is so time consuming that each coach can only coach one team.

Represent the above information on an entity relation (ER) diagram, in 3rd normal form, stating the primary key for each entity. **[13]**

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