UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
Cambridge International Diploma in Computing
Advanced Level

DIPLOMA IN COMPUTING   **5218**

Module 3

May/June 2005

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.
If you have been given an Answer Booklet, follow the instructions on the front cover of the Booklet.
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.

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International Examinations

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1   A secretary can save a document in text only format or in rich text format.

    Explain the difference between *text only* and *rich text* formats, giving **two** advantages of using text only format when transmitting a document from one computer to another. **[4]**

2   JUMP 300 is an instruction to be executed by a processor. It means that the next instruction the processor should process is held in location 300.

    Describe the stages of the fetch/decode/execute cycle and the effects on the contents of the registers in the processing of this instruction. **[7]**

3   Two lists of numbers need to be combined into a single list which will be in numerical order, smallest first.

List A:	2	3	8	11	17
List B:	7	10	5	6	9

    (a) By showing each of the stages, describe how list B can be sorted into numerical order using an insertion sort. **[4]**

    (b) Explain how list A and the sorted list B can be merged to give a complete, sorted, set of numbers. **[6]**

4   A mail order company relies heavily on computer systems to maintain the customer records, supplier records, a stock file and personnel records including the payroll.

    A new computer system has been developed for the company and the systems analyst has to decide how it should be implemented. Parallel running has been rejected as being too expensive.

    Discuss the use of the following implementation approaches with reference to this example:

    (i) direct implementation (Big Bang)

    (ii) phased implementation

    (iii) pilot implementation. **[9]**

5   An organisation manages an intranet.

    (a) (i) Explain how an intranet differs from the internet. **[2]**

    (ii) Pages on the intranet are produced using hypertext mark up language (HTML). Describe **three** HTML methods that can be used to enhance free text to make the pages more user friendly. **[6]**

(b) LANs are used to help communication around the company. Explain the purpose of

    (i) routers,

    (ii) bridges,

   (iii) modems

    as parts of the company computer networks. **[6]**

(c) A network operating system (NOS) is used to control the network. Describe

    (i) transparency,

    (ii) directory services,

   (iii) security

    as components of a NOS. **[6]**

6 (a) Explain the difference between interpretation and compilation of a program written in a high level language. **[2]**

(b) Explain what happens during the lexical analysis stage of compilation. **[5]**

(c) Describe **two** things that happen during code generation. **[4]**

7 (a) Express the denary number 78 as

    (i) a binary number stored in an 8 bit byte,

    (ii) a hexadecimal number,

   (iii) a number stored in binary coded decimal (BCD). **[6]**

(b) Explain how the binary value of 78 can be used to write down the equivalent octal value with a minimum amount of calculation **[3]**

(c) (i) Convert -63 and -94 into 2's complement, 8 bit, binary numbers. **[2]**

    (ii) Add the binary values obtained in (i) together. **[2]**

   (iii) Comment on the result that you obtained in (ii). **[2]**

8   Sto, Dis, May, David, Minah, John are all members of one family.

The following facts apply:

female(sto).
female(may).
female(minah).
male(john).
male(dis).
male(david).
parent(john,dis).
parent(john,may).
parent(dis,sto).
parent(dis,david).
parent(minah,dis).
parent(minah,may).

where   male(X).states that X is male
         female(X).states that X is female
         parent(X,Y).states that X is a parent of Y
         mother(X,Y):-parent(X,Y),female(X).states that X is mother of
                          Y if X is parent of Y and X is female.

(a) By using examples from the facts given, explain what is meant by

  (i) instantiation.

  (ii) a goal.

  (iii) backtracking.   **[6]**

(b) A new rule states

  grandparent (X,Y):-parent(X,Z),parent(Z,Y).

  (i) Write down a rule to define grandmother.   **[2]**

  (ii) Explain how this new rule is used to find the grandmother of david.   **[2]**

9   Discuss the need for parallel architecture when processing some simulations.   **[4]**