ZIMBABWE SCHOOL EXAMINATIONS COUNCIL
General Certificate of Education Advanced Level

COMPUTING   9195/2
PAPER 2

NOVEMBER 2010 SESSION   3 hours

Additional materials:
Answer paper

TIME   3 hours

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces provided on the answer paper/answer booklet.

Answer **all** questions.

Write your answers on the separate answer paper provided.

If you use more than one sheet of paper, fasten the sheets together.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets [ ] at the end of each question or part question.

You are reminded of the need for good English and clear presentation in your answers.

This question paper consists of 3 printed pages and 1 blank page.

1   **(a)**   Explain in detail the meaning of *interrupt handling*.   [3]

     (b)   Outline the techniques that allow computer peripherals to operate independent of the computer.   [6]

     (c)   State and describe **three** database models.   [6]

2   Listed below are types of systems. Outline **three** features of each.

     (a)   Batch processing   [3]

     (b)   Multi-user online system   [3]

     (c)   Distributed systems   [3]

     (d)   Control system   [3]

3   **(a)**   Advanced Level computing students are required to submit their assignments using email.

         State **three** advantages of using this method.   [3]

     (b)   State **two** advantages of using ordinary mail over the use of email.   [2]

4   **(a)**   Outline the algorithm for binary search.   [10]

     (b)   Apply the binary search to the following **8** keys of records in a file to trace for the key **7**.

         2   5   7   9   11   17   23   31.   [3]

5   **(a)**   Explain the difference between sorting and merging and state when each technique would be used.   [4]

     (b)   There are different sorting and merging algorithms. What criteria might be used to determine which particular algorithm to use?   [4]

6   **(a)**   File organisations can take various forms as indicated below:

         (i)   serial files

         (ii)   sequential files

         (iii)   indexed sequential files

         (iv)   random files

         State **two** features and **one** application of each file organisation.   [12]

     (b)   Define *multi-level index*.   [2]

7   A newly established supermarket in Harare has several checkout points, each
    with a terminal connected to a central computer. Items on sale are bar coded
    and prices are indicated on the shelf edges. At checkout point each bar code is
    read into the computer and the customer's bill is printed listing the item name,
    quantity bought, and their prices, with the total to be paid.

    (a)   Describe how the system generates a customer's bill.   [3]

    (b)   What needs to be done when certain prices change?   [2]

    (c)   Explain the other method of inputting data when the bar code reader fails. [1]

8   Describe the following high level languages and give **one** example for each.

    (a)   imperative programming language   [3]

    (b)   logic programming language   [3]

    (c)   functional programming language   [3]

    (d)   special purpose language   [3]

9   The program Radix-Convert, listed below calls a recursive procedure, OUT. The
    program is run, and the values 46 and 3 are input. Write down, in the correct order,
    all the values printed. Show your reasoning clearly. (Note that in this language,
    $X\ DIV\ Y$ gives the integral part of the quotient when X is divided by y and $x\ mod\ y$
    gives the remainder)

    program RADIX-CONVERT
    declare integers a, b
    input a,
    input b,
    print (a, b)

    procedure OUT (x, y)
    declare integers a, b
    $a = x\ DIV\ y$
    $b = x\ MOD\ y$
    If $a > O$ then OUT (a, y)
    Print (b)
    End OUT   [7]

10 A college uses a range of software packages from different suppliers. Each
    package has a different user interface. The college is considering changing
    its interface.

    (a)   Give **four** advantages of having a common user interface.   [4]

    (b)   Explain how the features of graphical user interface protect the users from
              typing or responding to obscure operating system commands and codes.   [4]