COMPUTER DEPARTMENT

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL
General Certificate of Education Advanced Level

COMPUTING
PAPER 2

9348/1

Friday   15 NOVEMBER 2002   Afternoon   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.

[Turn over

November 2002
PAPER 1

1 **(a)** Can send message to multiple recipients

- has more privacy
- data can be sent in compressed form
- avoid use of paper.

[ANY 2]   max: [2]

(b) **(i)** Communication channel in which data can be sent one way only. [1]

(ii) Communication channel in which data can be sent in two opposite ways but one at a time. [1]

(iii) Communication channel in which data can be transmitted in two opposite ways simultaneously. [1]

2 **(a)** - Errors reported during translation by translator e.g. syntax errors. [1]

- Runtime errors are errors which occur when a computer executes an instruction e.g. division by zero. [1]

- Error introduced by truncation/approximation of a numeric data item by is nearest equivalent. [1]

(b) The purpose of testing is to ensure that a program processes **correct data** correctly and copes **with incorrect** data in a controlled and **predictable manner**. [3]

3 **(a)** Prediction

- Monitoring and control
- Costing
- Analysis and interpretation [2]

(b) Cannot work on their own without any information being fed.

4 **(a)** Technical Documentation:

All the documentation produced during the development of the software. It includes:

- system specification
- system flow charts
- data flow diagrams
- testing strategies
- Program coding
- Pseudocode

User Documentation:
User's manual written in non-technical language used to:

- outline the purpose of the software system
- describe how to use it. [4]

(b) Easy to detect errors
Easy to modify [2]

5 (a) (i) It is a number which is used to identify a location or a memory cell. [1]

(ii) Given an address, any cell could be accessed. [1]

(b) (i) The direct method of addressing is not adequate in a modern computer system because it can restrict the extent of addressable memory and would make table access difficult to implement. [2]

(ii) The other methods of addressing which need to be described are indexed addressing, indirect addressing, relative addressing, immediate addressing and implied addressing. max: [2]

(iii) Indexed Addressing

It uses an index register, the contents of which is added to the operand e.g. LDA MEMI,X

the operand MEMI refers to the address of the start of a list of items in memory and the register X will have been loaded with a number containing the position of the required element in the list. [1]

Indirect addressing
It is where the operand refers to an address which contains the address where the value of the operand is stored e.g. ST . (POINTER) [1]

The contents of the accumulator are stored in the memory location which has its address stored in the location with address POINTER
Max [2]

6 (a) Need to guard against:

- Unauthorised users logging on to the network. [2]
  Unauthorised users accessing confidential data.

- outsiders tapping the line to gain access to data. [2]

- Protect from physical threats. [2]

- Viruses (maximum 6 marks) [2]

(b) (i) Using serial transmission, single bits are transmitted one after the other, whereas in parallel transmission, typically 8, 16 or 32 bits can be transmitted simultaneously. [2]

(ii) The advantage of serial transmission is that almost all computers have a serial data communications port, so different types of computers can be linked in a single network. The disadvantage is that the rate of transmission is low. [2]

(a) - Observation – spending sometime in the department concerned, seeing at first hand the procedures used, workloads and bottle necks.

- reading the documentation associated with the system.

- asking clerical staff to keep special counts during a trial period to establish where problems might lie.

- questionnaires: these can be useful when a lot of people will be affected by the new system.

- interviews: this is where concerned stakeholders are interviewed. [5]

(b) - the volume of data
- the number of users
- location of users
- type of user(s)
- the nature of the system – batch or on-line
- hardware currently in use
- security considerations
- the software to be used. [max 5]

8 **(a)** Stages involved in compilation are:

(i) - Lexical scan
- syntax checking
- code generation [3]

(ii) A compiler translates the whole source program at once before it can be run whereas the interpreter translates the source program one instruction at a time. [4]

Advantage of a compiler:
It ensures that the program need only be translated once and run as required [1]

Advantage of a Interpreter:
It is helpful for line-by-line fault finding when developing programs. [1]

(b) Software in ROM can be accessed faster than that on a backing storage medium. [1]

- Large programs can be kept on backing storage and can easily be changed. [1]

(a) **(i)** **Initialise:** set front = 1
rear = 100 [2]

(ii) Add the queue:
If size = 100 the queue full
else
R = (R + 1) mod 100
q(R) = new item [5]
increment size
endif.

(i) To remove an item from the queue:
If size = 0 then queue empty
else
x = q(F)
size = size –1 [5]
F = (F + 1) mod 100
Endif.

10 **(a)** **(i)** Master file – principal source of data for an application. [1]

(ii) Methods of assessing records in a file in the order in which they
are stored. [1]

(iii) Checking to see if it is sensible/reasonable/compatible in the
context for which the data is intended. [1]

(b) reduce seek time for accessing records by traversing the two files once. [2]

(c)

unsorted
transaction
file

sort

sorted transaction

Old master file
stored off line
(grand father)

Old
master file
(father)

update

New master file
(son)

[7]