INTERNATIONAL BACCALAUREATE
BACCALAURÉAT INTERNATIONAL
BACHILLERATO INTERNACIONAL

COMPUTER SCIENCE
STANDARD LEVEL
PAPER 1

Wednesday 14 November 2001 (afternoon)

1 hour 15 minutes

INSTRUCTIONS TO CANDIDATES

- Do not open this examination paper until instructed to do so.
- Answer all of Section A.
- Answer three questions from Section B.

SECTION A

*Answer **all** questions.*

1. Identify examples of **two** items that are included in *user documentation* and **two** items that are included in *system documentation* of a program. *[4 marks]*

2. Describe the difference between *local* and *global* variables. *[4 marks]*

3. An alarm system is installed in a block of apartments that are designed for elderly people living alone. If help is needed the person living in the apartment activates the alarm that is connected to a computer in a separate building where the caretaker lives.

(a) State a suitable *input device* for the person living in the apartment. *[1 mark]*

(b) State a suitable form of output in the caretaker's house. *[1 mark]*

4. Explain the term *syntax* in relation to a language translator. *[3 marks]*

5. State **two** advantages of the seller in a fast food restaurant using a *touch sensitive* screen to take orders. *[2 marks]*

6. The binary number 00011100 represents an integer held in an 8-bit register. Calculate the decimal equivalent of this number. *[1 mark]*

7. Explain why, when recording music for a CD, the sound needs to be converted before it can be processed by a computer. *[2 marks]*

8. Outline the process of updating a *sequential master* file with a *transaction* file. *[4 marks]*

9. Estimate the number of diskettes with capacity 1.4 MB that would be needed to store a file of 4250 KB. *[2 marks]*

10. Identify **two** logical operations that are carried out by the ALU. *[2 marks]*

11. Define the term *protocol* in the sending of data from one computer to another. *[4 marks]*

SECTION B

*Answer **three** questions.*

12. Below is the fragment of a procedure that sorts 5 characters into alphabetical order.

```
for COUNT1<-- 1 upto 4 do
    for COUNT2<--COUNT1+1 upto 5 do
    if LETTER(COUNT1)>LETTER(COUNT2)
    then TEMP<--LETTER(COUNT1)
         LETTER(COUNT1)<--LETTER(COUNT2)
         LETTER(COUNT2)<--TEMP
    endif
    endfor
endfor
```

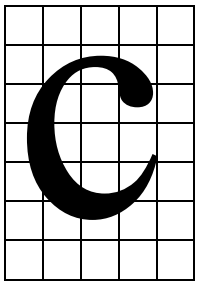
(a) Identify the type of sort that is carried out. *[1 mark]*

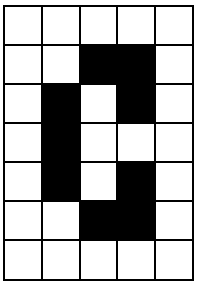
(b) Define fully the data type of `LETTER`. *[1 mark]*

(c) Rewrite the above as a full procedure `ALPHA`, that sorts *N* letters into alphabetical order. You can assume there will be no duplicated characters. *[4 marks]*

(d) Add the necessary statements and declarations needed to stop the procedure as soon as the data is sorted. *[4 marks]*

13. A scanner is used to transfer printed documents into text that can be used by a program. The sketch below illustrates this process.





0	0	0	0	0
0	0	1	1	0
0	1	0	1	0
0	1	0	0	0
0	1	0	1	0
0	0	1	1	0
0	0	0	0	0

(a) State the name for this technique. *[1 mark]*

(b) Explain how the software converts the original character to its character code. *[3 marks]*

(c) Outline why manufacturers of such systems prefer to use a standard font for characters to be read. *[2 marks]*

(d) Such a system can be used to read data from customers' cheques (checks) at a bank's processing centre. Compare the use of this method with the use of MICR. *[4 marks]*

14. A company that sells holidays decides to advertise using the Internet. The company employs an expert to create a website that includes photographs of holiday locations as well as explanatory text and prices.

(a) Outline the use of HTML and the use of an HTML editor in the creation of the website. *[2 marks]*

(b) Explain **two** advantages of using a digital camera rather than a scanner to input the photographs for the website. *[4 marks]*

(c) Outline the use of a web browser and a search engine by a user who is looking to book a holiday. *[4 marks]*

15. Drivers who use a bridge crossing a wide river have to pay to use the bridge. They can do this by stopping the car and paying in cash before crossing or, if they are regular users, they can pay a fixed fee per year. In this case, the driver attaches a special device to the windscreen that is detected as the car uses the bridge.

The company that owns the bridge needs to collect data about the number of drivers using it to see if more money-collectors are required, or if a second bridge needs to be built. The data collected will be sent by a wide area network (WAN) to the company's main office.

(a) Describe how the device attached to the windscreen could be used to allow the driver to cross the bridge without stopping. *[3 marks]*

(b) Outline the methods of data collection needed that would obtain the data required for the company. *[2 marks]*

(c) Explain **one** possible problem for the company if data integrity is lost during transmission using the WAN. *[2 marks]*

(d) Describe **one** method of trying to maintain data integrity. *[3 marks]*