INTERNATIONAL BACCALAUREATE
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M02/650/S(2)M

MARKSCHEME

May 2002

COMPUTER SCIENCE

Standard Level

Paper 2

8 pages

Subject Details: Computer Science SL Paper 2 Markscheme

Mark Allocation

Candidates are required to answer ALL questions. (***[30 marks]*** for question 1, ***[25 marks]*** for question 2 and ***[15 marks]*** for question 3.) Maximum total = ***[70 marks]***.

General

A markscheme often has more specific points worthy of a mark than the total allows. This is intentional. Do not award more than the maximum marks allowed for part of a question.

When deciding upon alternative answers by candidates to those given in the markscheme, consider the following points:

- Each marking point has a separate line and the end is signified by means of a semi-colon (;).
- An alternative answer or wording is indicated in the markscheme by a "/"; either wording can be accepted.
- Words in (…) in the markscheme are not necessary to gain the mark.
- The order of points does not have to be as written (unless stated otherwise).
- If the candidate's answer has the same 'meaning' or can be clearly interpreted as being the same as that in the mark scheme then award the mark.
- Mark positively. Give candidates credit for what they have achieved, and for what they have got correct, rather than penalising them for what they have not achieved or what they have got wrong.
- Remember that many candidates are writing in a second language; be forgiving of minor linguistic slips. Effective communication is more important than grammatical niceties.
- Occasionally, a part of a question may require a calculation whose answer is required for subsequent parts. If an error is made in the first part then it should be penalised. However, if the incorrect answer is used correctly in subsequent parts then **follow through** marks should be awarded. Indicate this with **"FT"**.

1. (a) *Award marks as allocated up to a maximum of **[2 marks]**.*

OUTPUT	COUNT	PLANE(COUNT)	DUE(COUNT)	CALL(COUNT)
AF344	1	LH543	955	875
	2	BD556	950	860
	3	ZZZ		

subtract ***[1 mark]*** for incorrect line; ***[2 marks]***

(b) (i) *Award marks as allocated up to a maximum of **[2 marks]**.*

ZZZ ***[1 mark]***;
ZZZ
ZZZ

call to empty list will return ZZZ ***[1 mark]***; ***[2 marks]***

(ii) *Award marks as allocated up to a maximum of **[2 marks]**.*
before output statement a check for
PLANE;
= "ZZZ";
exit procedure without any further processing; ***[2 marks]***

Do not award second mark if COUNT *is output (unless 0).*

(c) *Award marks as allocated up to a maximum of **[9 marks]**.*

- declaration of function;
- arguments passed as string ***[2 marks]*** *(accept other **but** not integer)*;
- hours and minutes separated ***[2 marks]***;
- calculation ***[2 marks]***. *Award **[1 mark]** if small error*;
- value returned through function error; ***[9 marks]***

(d) *Award marks as allocated up to a maximum of **[9 marks]**.*

procedure declaration with correct parameters ***[2 marks]***;
input plane ID and time now;
late due time from database and convert ***[2 marks]***;
loop through list;
until ZZZ
when found replace with PLANE;
times of due and call enter;
ZZZ in next slot; ***[9 marks]***

(e) *Award marks as allocated up to a maximum of **[6 marks]**.*

calculate overdue by call – due = –ve+
move up list ***[2 marks]***;
calculate call – due. if > 60 then delete
and move up the others ***[2 marks]***;
sort list according to due time in descending order ***[2 marks]***; ***[6 marks]***

2. (a) *Award **[1 mark]** for need and **[1 mark]** for reason, up to a maximum of **[4 marks]**.*

high number of computations;
needs fast processor;
vast input / output;
needs large RAM;
size of scans;
requires large secondary storage; ***[4 marks]***

(b) (i) 2^8 **or** 256 shades of grey; ***[1 mark max]***

(ii) *Award marks as allocated up to a maximum of **[2 marks]**.*

256 × 512 bits × 512 bytes;
= 256 MB; ***[2 marks]***

(c) *Award marks as allocated up to a maximum of **[6 marks]**.*

computer crime is an illegal use of the computer for **gain**;
whereas computer abuse is the use of material for purposes other than that for which it was intended;

e.g. taking pictures of CT scans which are already published and available and presenting them in a different way from that intended would be abuse ***[2 marks]***;
hacking into the data sent from medical centre to university centre and presenting as that of someone else would be crime ***[2 marks]***; ***[6 marks]***

*There are many possibilities but give **[1 mark]** for definitions of abuse **[1 mark]** crime **[2 marks]** for each example from Case Study.*

(d) *Award **[1 mark]** for smaller and **[1 mark]** for ability to rebuild **[2 marks]** for each example, up to a maximum of **[6 marks]**.*

data compression means rewriting data in such a way that it is smaller but contains enough information to restore back to full size ***[2 marks]***;
in the Case Study:
video files compressed before recording ***[2 marks]***;
compressed to send across network ***[2 marks]***; ***[6 marks]***

(e) *Award **[1 mark]** for each valid point and **[1 mark]** for each explanation, up to a maximum of **[4 marks]**. There must be one medical and one fossil example. If the point seems reasonable but not in Case Study check with Chief Examiner.*

e.g. for the fossils it would be a pity to misinterpret and perhaps come to wrong conclusions ***[2 marks]*** which may never be noticed;
for the human body scan it would be much more serious and could lead to wrong diagnosis ***[1 mark]*** with critical results ***[1 mark]***; ***[4 marks]***

(f) *Award **[1 mark]** for identifying a major advance and **[1 mark]** for discussion / explanation, up to a maximum of **[2 marks]**.*

e.g. VA has made major changes to the dating of fossils hence we know much more about our history; ***[2 marks]***

3. (a) *Award marks as allocated up to a maximum of **[2 marks]**.*

linear searches each item until required is found;
binary finds position by successively comparing required with mid-value; ***[2 marks]***

(b) *Award marks as allocated up to a maximum of **[3 marks]**.*

linear fast now because simple;
but as data increased linear will increase linearly and binary by less;
at some point cross over; ***[3 marks]***

(c) *Award marks as allocated up to a maximum of **[3 marks]**.*

add array of integer to list of data items;
add one each time used;
when no memory left replace item with smallest count by new item; ***[3 marks]***

(d) *Award marks as allocated up to a maximum of **[3 marks]**.*

simple user**;**
single tasking;
interactive; ***[3 marks]***

(e) *Award marks as allocated up to a maximum of **[4 marks]**.*

programme → ROM ***[2 marks]*** data → RAM ***[2 marks]***; ***[4 marks]***