

# **Markscheme**

**May 2016**

**Computer science**

**Standard level**

**Paper 1**

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### General marking instructions

1. Follow the markscheme provided, award only whole marks and mark only in **RED**.
2. Make sure that the question you are about to mark is highlighted in the mark panel on the right-hand side of the screen.
3. Where a mark is awarded, a tick/check (✓) **must** be placed in the text at the **precise point** where it becomes clear that the candidate deserves the mark. **One tick to be shown for each mark awarded.**
4. Sometimes, careful consideration is required to decide whether or not to award a mark. In these cases use RM™ Assessor annotations to support your decision. You are encouraged to write comments where it helps clarity, especially for re-marking purposes. Use a text box for these additional comments. It should be remembered that the script may be returned to the candidate.
5. Personal codes/notations are unacceptable.
6. Where an answer to a part question is worth no marks but the candidate has attempted the part question, enter a zero in the mark panel on the right-hand side of the screen. Where an answer to a part question is worth no marks because the candidate has not attempted the part question, enter an “NR” in the mark panel on the right-hand side of the screen.
7. Ensure that you have viewed **every** page including any additional sheets. Please ensure that you stamp ‘SEEN’ on any page that contains no other annotation.
8. A mark should not be awarded where there is contradiction within an answer. Make a comment to this effect using a text box or the “CON” stamp.

**Subject details: Computer science SL paper 1 markscheme****Mark allocation**

Section A: Candidates are required to answer **all** questions. Total 25 marks.

Section B: Candidates are required to answer **all** questions. Total 45 marks.

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 that part of a question.

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

- Each statement worth one 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.
- If the candidate’s answer has the same meaning or can be clearly interpreted as being the same as that in the markscheme then award the mark.
- Mark positively. Give candidates credit for what they have achieved and for what they have got correct, rather than penalizing 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. In this subject effective communication is more important than grammatical accuracy.
- 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 penalized. However, if the incorrect answer is used correctly in subsequent parts then **follow through** marks should be awarded. Indicate this with “**FT**”.

**General guidance**

Issue	Guidance
Answering more than the quantity of responses prescribed in the questions	<ul style="list-style-type: none"> <li>• In the case of an “identify” question read all answers and mark positively up to the maximum marks. Disregard incorrect answers.</li> <li>• In the case of a “describe” question, which asks for a certain number of facts <i>eg</i> “describe two kinds”, mark the first two correct answers. This could include two descriptions, one description and one identification, or two identifications.</li> <li>• In the case of an “explain” question, which asks for a specified number of explanations <i>eg</i> “explain two reasons”, mark the first two correct answers. This could include two full explanations, one explanation, one partial explanation <i>etc.</i></li> </ul>

## Section A

1. *Award up to [2 max].  
Award [1] for evidence that the candidate knows what is meant by “maintaining legacy systems”.  
Award [1] for any appropriate problem outlined.*

*Example:*

Maintaining previous/outdated computer system, which uses old technology and old application programs ;  
That are hard to understand/expensive to change/evolve **because** programs might be disorganized/ documentation might be missing/incomplete/unreliable;  
Compatibility issues (typically refer to old programming languages/old database technology);  
Maintaining but not updating the old system can lead to compatibility / security issues;  
It may be difficult to recruit staff/programmers familiar with old languages/operating systems;  
Database contains inconsistencies/redundancies (eg information systems and no DBMS);  
Usually pre-internet, needs interfaces;  
Typically large and complex systems/mainframes; [2]

2. A system or a partially functional prototype;  
Given to users to test for functionality or to gain feedback on functions or the user interface; [2]
3. *Award [1] for **one** advantage and [1] for **one** disadvantage, and [1] for expanding on each of them, up to [4 max].*

*Examples of advantages:*

- Portability;  
Printed material is more easily transportable and can be moved around (eg for a scanner/printer);
- Extent of material;  
Books/technical instructions for installation may have more details, and be more useful to provide deeper explanations;
- Availability;  
It is always available (no power cut problems);

*Examples of disadvantages:*

- Readability;  
Font size online can be (easily) magnified;
- Trouble-shooting/cross-reference/usability;  
Online is faster and usually has links to other pages whereas paper is a thick manual;
- Aging;  
Online is more frequently updated than paper manuals;
- Environmental;  
Waste of paper versus energy consumption; [4]

**Note:** *Accept expansions of these or other plausible advantages/disadvantages.*

4. *Award up to [2 max].  
A failover system is a standby/redundant system;  
Which is used to eliminate/reduce the impact on users/owners;  
By automatically taking over if the primary system suddenly becomes unavailable; [2]*

5. *Award up to [2 max].*  
 Obtains the data/instructions from the memory;  
 Interprets/decodes them into commands/steps/signals;  
 Controls transfer of data and instructions among other units of a CPU (for example, command to ALU for execution);  
 Manages/coordinates all the units of the computer;  
 etc. [2]

6. *Award up to [2 max].*  
 Cache memory is closer to CPU/faster to access than main memory/incorporated on the chip;  
 By holding recently/frequently used data and instructions in cache;  
 Execution of program/fetching instructions and data is faster; [2]

7. *Award [1] for one feature and [1] for a reason/explanation.*  
*Examples:*  
 Memory management;  
 Game applications use a lot of memory and require constant refreshing;  
  
 Processor loading of OS functions (efficiency);  
 Graphics handling of OS (as distinct from graphics card),  
  
 GUI;  
 O/S needs to handle input from appropriate devices; [2]

8. *Award [3] marks for all 8 correct rows in the truth table.*  
*Award [2] marks if only 6/7 correct rows in the truth table.*  
*Award [1] mark if only 5 correct rows in the truth table.*

A	B	C	A XOR (B OR C)
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	0

9. *Award [1] for correct 111011.*  
*Award [1] for using two leading zeroes for the 8-bit register.*  
  
 00111011; [2]

10. Award **[1]** for correct output.  
Award **[1]** for each of the **three** correct iterations (three rows).

D	Z	B	Z<L ?	output
46	1	false	true	
15	2	true	true	
5	3	false	false	
				(3 , true)

**[4]**