M17/4/COMSC/HP1/ENG/TZ0/XX/M

Markscheme

May 2017

Computer science

Higher level

Paper 1

19 pages

The following are the annotations available to use when marking responses.

Annotation	Explanation	Associated shortcut
✓	Good Response/Good Point	(Alt+) 0
✗	Incorrect Point	(Alt+) 1
?	Unclear	
BOD	Benefit of the doubt	
NBOD	No benefit of doubt	
SEEN	Seen	
TV	Too vague	
REP	Repetition	
FT	Follow through	(Alt+) 2
L	(Comp Sci) Language	(Alt+) 3
D	Description	(Alt+) 4
A+	Analysis	(Alt+) 5
REF	Reference	(Alt+) 6
DEV	Development	(Alt+) 7
B+	Balanced argument	
OC	Off course	(Alt+) 8
EVAL	Evaluation	
O	Opinion	
▭	Dynamic, horizontal line that can be expanded	(Alt+) 9
〰	Dynamic, horizontal wavy line that can be expanded	
⌇	Dynamic, vertical wavy line that can be expanded	
T	Text box	

You **must** make sure you have looked at all pages. Please put the SEEN annotation on any blank page, to indicate that you have seen it.

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 HL 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 75 marks.
Maximum total = 100 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	• In the case of an "identify" question, read all answers and mark positively up to the maximum marks. Disregard incorrect answers. • In the case of a "describe" question, which asks for a certain number of facts *eg* "describe two kinds", mark the first two correct answers. This could include two descriptions, one description and one identification, or two identifications. • In the case of an "explain" question, which asks for a specified number of explanations *eg* "explain two reasons ", mark the first two correct answers. This could include two full explanations, one explanation, one partial explanation *etc*.

Section A

1. It is when an application/program is tested/ to get feedback (for errors/improvements);
By releasing it to the general public/users/stakeholders before final release; **[2]**

2. *Award up to **[2 max]**.*
Natural disaster/power failure;
Accidental deletion;
Malicious activities (hacking/theft/viruses);
Hardware/software/system failure;
Bad integration/migration of systems/data;
Transmission error;
Lossy compression when the original no longer available only the modified version; **[2]**

3. *Award up to **[2 max]**.*
To patch any vulnerabilities/bugs/cyberspace threats;
To provide improved functionality/new functions/usability/maximise efficiencies;
To generate income for the software company/to innovate and stay ahead of other software companies;
To ensure compatibility with other (updated) technologies; **[2]**

4. Cache memory can be accessed/is faster than RAM;
It is used to hold common/expected/frequently used data/operations;
Closer to CPU than RAM/situated between RAM and CPU/on same board as CPU/with faster read/write speed;
Cache memory is static RAM and this memory doesn't need to be constantly refreshed; **[2]**

5. The OS allocates (and deallocates) specific sections of memory to each program/process/module;
This ensures that the memory assigned to one program is not overwritten;
Uses secondary/virtual memory to allow more processes to run simultaneously;
Note: *Do not accept vague reasons.* **[2]**

6. *Award up to **[2 max]** for any two of the following:*
Physical layer;
Data link layer;
Network layer;
Transport layer;
Session layer;
Presentation layer;
Application layer; **[2]**

7. Some compression methods (lossy) discard data;
Decompression will not return the complete file/some detail will have been removed;
Which in some cases *eg* audio/video may be unacceptable;
If original not saved/lost there is no way to recover it; **[3]**

8. *Award up to* ***[3 max]****.*
The MAC address identifies a specific device (network card/controller);
MAC address checked against list of approved addresses/whitelist If not on list access to network is denied;
Prevents unauthorised access/makes access more difficult/(unless the NIC is cloned)/providing an extra layer to authentication process;
data sent to a specific MAC address can only be accessed on that device; **[3]**

9. Data;
A pointer/reference to the previous node;
A pointer/reference to the next node; **[3]**

10. *Award up to* ***[2 max]****.*
A recursive call involves the use of stacks;
For storing/pushing on/popping out data/ return addresses/return values *etc*;
If many recursive calls are made, the memory usage can be very large; **[2]**

11. (Have sensors that) can react to external stimuli/ changes in its environment;
without needing to contact any central/outside source/by making its own decisions/acts independently; **[2]**