Student responses with examiner commentary template

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Student responses with examiner commentary

A-level Computer Science 7516
7516D

For teaching from September 2015]

For assessment from Summer 2016]

Introduction

These resources should be used in conjunction with the Specimen Assessment material (7516D) from the AQA website. This document illustrates how examiners intend to apply the mark scheme in live papers. While every attempt has been made to show a range of student responses examiners have used responses, and subsequent comments, which will provide teachers with the best opportunity to understand the application of the mark scheme. Examples given in this commentary use Python3.

Question Number	Student answer	Marks awarded	Marks available	Commentary
1.1	0	1	1	The student has clearly written a number from the set of natural numbers. There is no general agreement about whether 0 is a natural number or not and, for this specification, 0 is accepted as a natural number.
1.2	square root of 2	1	1	The student has provided a correct example of an irrational number.
2.1	D3 is 214	1	2	One mark for correct final answer of 214. When asked to show working a student needs to be careful not to lose marks by failing to do this. Even though a calculator is allowed for this paper we are looking to see the method used by the student.
2.2	1001.	1	2	The student has only provided 4 bits but does gain credit for these representing the number 9.
2.3	01000011	0	2	Although the student has written the binary for +67, the mark scheme gives no credit for this since it is 2's complement being tested.
2.4	10101011	1	1	Student has correctly completed the addition
2.5	The number is too big	1	1	This answer is enough to gain credit from the mark scheme.
3.1	A character code links a number to a character.	1	1	This answer is enough to gain credit but can be improved. The idea of uniqueness is important for character codes.
3.2	<table><tr><th>Character</th><th>Binary form of ASCII</th></tr><tr><td>b</td><td>1100010</td></tr><tr><td>e</td><td>1100100</td></tr></table>	1	2	The student has correctly identified the code for b (which will be the next binary code from that for character a). They have not done this correctly for the character e.

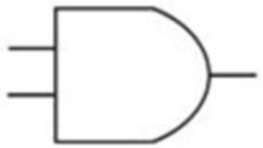
3.3	1000011	1	1	The candidate has correctly completed this question part.
4.1	1 : network quiet 2 : collision occurs 3 : no collision detected 4 : 5 seconds	1	4	Student will gain one mark for stating that the network is quiet but this answer would be better by referring to the channel being idle. This student appears to be thinking more about CSMA/CD which can detect collisions. The CSMA/CA protocol requires acknowledgments to be received. The protocol also waits for a random period of time rather than a set period as given by this student.
4.2	The SSID is an identifier for a wireless network. A network administrator might turn off broadcasting the SSID for security reasons.	2	3	The student has shown knowledge that the SSID is an identifier for a wireless network and secures a mark. They also show some understanding about the broadcasting of SSID as being a security concern. The answer could be improved by discussing broadcasting actually announces your network presence. The student has not mentioned how the client uses a SSID to join the network and misses out on this mark.
4.3	The coffee shop might have a slower connection to the internet than at a home. The coffee shop could be busy with a lot of people accessing the hotspot.	2	2	The student has shown understanding that the shop might have a slower connection but the answer could be improved by talking about bandwidth. The student has also put across the point of many clients accessing the network to secure full marks for this question.
5.1	Encryption is making data secure by muddling it up before sending so that hackers can't read it.	1	2	The student has not explained encryption very well and 'muddling it up' does not match to encoding. The point about hackers not being able to read the data does match to a mark scheme point - 'so that other parties cannot read'

				and the student receives a mark.
5.2	Because the source code is publicly available anybody can check the code for security problems. Programmers can learn from open source software by seeing how people have written code.	2	2	The student has put across two clear points to show their understanding.
5.3	Searching for bugs in complicated programs is hard to do.	1	1	The student has put across the point that this is a complicated program and this links to the idea of complex software in the mark scheme.
5.4	Reason for: They might want to decrypt messages form suspected criminals. Reason against: It is an invasion of privacy.	2	2	The student has gained both marks by clearly identifying a reason for and against.
6.1	Programs are stored in RAM and then executed by a processor.	1	2	The student gains a mark for explaining that programs are stored in RAM but their second point is not good enough. The student needs to show that they understand that it is instructions that are executed by the processor, not whole programs.
6.2	Program Counter contents moved to the memory address register. This is then moved to the memory buffer register. At the same time the program counter is incremented. The instruction is then moved to the current instruction register and executed.	3	6	This answer is marked at level 2 from the mark scheme as it does provide an adequate description of one part of the cycle. The answer is also structured with the points in the correct order. The student has missed out the idea of going to main memory to fetch the instruction and has not provided any depth to the decode or execute stages.
6.3	A language that is based on instructions of the processor.	1	1	The student will gain a mark for this answer as it matches the idea of the instruction set of the computer.
6.4	The opcode represents the instruction to be executed which in this case is CMP (compare)	1	1	The student has provided the correct response and even provided further details about the instruction.
6.5	the instruction contains a value to be used	2	2	The student has provided just enough detail to get 1 mark

	mov r1, #10			for knowledge and then shown their understanding by providing a correct example. To improve the student could extend 'value used' to 'a numerical value to be used'

6.6	cmp r1, #5
	bne end
	mov r2, #10
	end:
		4	4	The candidate has provided the correct response to this question.

7	Driving a car is a complex activity as you need to respond quickly to ever changing situations. Compared to a car painting robot that only stays in one place and keeps following the same instructions. Driving a car also requires a lot of sensing in terms of direction, speed and environment and might use a variety of sensors. A car painting robot might have few if any sensors. The long range radar could be used to identify objects in the way of the car and create a digital map of the surroundings for the computer to process. The short range radar might be used to keep a set distance away from the car in front. The video camera could be used to identify and recognise signage along the streets or respond to traffic lights. Whilst car painting robots are an obvious use for robots it is clear to see why car control is harder to program due to the complexity of this activity.	7	9	The student has provided a coherent discussion and matches against level 3 of the mark scheme. They have compared car painting to car control well. When discussing the sensing and processing they have not mentioned clearly the processing that would be involved but they have presented why the data is needed.
8.1	Solid state memory is more likely to survive a crash than	2	2	The student has described two different points and placed

<table>
<tr><td></td><td>a hard disk drive.
As you can write to solid state faster the quality of the audio might be better.</td><td></td><td></td><td>some detail into their answer.
The first point clearly matches to the idea of robustness.
The second point, whilst different to the mark scheme, would gain credit as they have put across the idea of faster write speed and linked this to higher audio quality rather than the idea of more data being recorded.</td></tr>
<tr><td>8.2</td><td>8000 x 2 = 16000 bytes per second
16000 x 360 = 5760000 bytes = 5625 KB</td><td>2</td><td>3</td><td>The student has clearly worked through the stages but not shown how they have moved from bytes to KB (/1024) so they have not secured the second working mark.</td></tr>
<tr><td>8.3</td><td>Because Nyquist says so.</td><td>1</td><td>2</td><td>The student has just about written enough to secure one mark but this is a 'benefit of doubt'. The student can improve this answer by mentioning Nyquist's theorem and linking it back to the question by using the 8000 Hz sample rate leading to a highest audio frequency of 4000 Hz.</td></tr>
<tr><td>9.1</td><td><table><tr><th>A</th><th>B</th><th>Q</th></tr><tr><td>0</td><td>0</td><td>0</td></tr><tr><td>0</td><td>1</td><td>0</td></tr><tr><td>1</td><td>0</td><td>0</td></tr><tr><td>1</td><td>1</td><td>1</td></tr></table>  </td><td></td><td></td><td>The student has completed the truth table correctly and given the correct AND gate symbol.</td></tr>
<tr><td>9.2</td><td>A.B(A+B)
A.B.A + B
A.B + B
B.(A+1)</td><td>1</td><td>3</td><td>This student has made a mistake in their first line of the simplification. However, on the second line they do make use of the identity A.A = A and so gain a mark for their working.</td></tr>
</table>

	B			If the student had included B.1 before the final answer they would have merited another mark. [are we still going to mark in this way?]
9.3	(X + Y).(X + not Y) (X + Y).X + not y XX + Y + not y 1	0	3	The student continues to mishandle expansion of brackets. In their working they do not use any of the identities we are looking for.
10.1	Version B	1	1	The student has provided the correct response.
10.2	A compiler translates all of the code into an executable and then executes it. An interpreter does it line by line. A compiler runs faster than an interpreter.	1	2	The student has made the point that a compiler translates the whole source code and compares this against an interpreter working line by line. The point about the compiler then executing the code is wrong but doesn't invalidate the main point. In the second point the student might be trying to state that compiled code runs faster than interpreted code but their answer would not gain credit
10.3	Intermediate code is not executable but is run by a virtual machine. It is useful for distributing code to different computers.	2	2	The student has a good grasp of what intermediate code is. Their first point matches against the mark scheme as intermediate code is not executable. Their second point puts across the idea of the code running on different computers and is enough to gain the mark. The answer can be improved by using the term 'computing platforms' as different computers might actually refer to a room of 25 different computers which are all the same hardware.

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