National Qualifications 2016

2016 Computing Science

National 5

Finalised Marking Instructions

General Marking Principles for National 5 Computing Science

This information is provided to help you understand the general principles you must apply when marking candidate responses to questions in this Paper. These principles must be read in conjunction with the detailed marking instructions, which identify the key.

(a) Marks for each candidate response must always be assigned in line with these General Marking Principles and the Detailed Marking Instructions for this assessment.

(b) Marking should always be positive. This means that, for each candidate response, marks are accumulated for the demonstration of relevant skills, knowledge and understanding: they are not deducted from a maximum on the basis of errors or omissions.

(c) If a specific candidate response does not seem to be covered by either the principles or detailed Marking Instructions, and you are uncertain how to assess it, you must seek guidance from your Team Leader.

Marking Instructions for each question

Question			Expected Answer(s)	Max Mark	Additional Guidance
1.			1 1 1 0 0 0 1 1	**1**	Must be an 8 bit number.

Question			Expected Answer(s)	Max Mark	Additional Guidance
2.			Easier to edit/maintain or Another programmer can understand the code	**1**	Answer must imply that editing (or later maintenance) is easier with readable code. Answer must indicate that readability of code is to aid other peoples' understanding and not the writer's own understanding of the code.

Question			Expected Answer(s)	Max Mark	Additional Guidance
3.			The database cannot be edited	**1**	Answer could include examples: • wouldn't be able to add tables/records/fields • wouldn't be able to edit data • wouldn't be able to delete data.

Question			Expected Answer(s)	Max Mark	Additional Guidance
4.			Any **one** from: • no typing error/human error • only one can be selected • limits possible inputs • appropriate input when no keyboard, for example touchscreen device	**1**	Do not allow 'easier' with no explanation.

Question			Expected Answer(s)	Max Mark	Additional Guidance
5.			To store data temporarily	**1**	Data could refer to an address, a value or an instruction. 'Temporary' must be either stated or implied (for example "while processing") to distinguish answer from RAM.

Question			Expected Answer(s)	Max Mark	Additional Guidance
6.			Any **two** • Firewall • Spam killer • Spyware protection • Malware protection (Trojan) • Biometric (software) • Email protection • Parental control • Privacy • Phishing protection • Encryption (software) • Password manager • Backup • Social network protection	**2**	Not 'virus protection' as this is given in question. Other answers may be acceptable. Note – If candidates write simply "spyware", "malware", "phishing" these would not be accepted as the security suite should be preventing these. This should be indicated in candidate's answer, for example "anti"-spyware.

Question			Expected Answer(s)	Max Mark	Additional Guidance
7.			• phishing • malware\spyware • hacking • virus • trojan	**2**	Description of bullet points is acceptable. Candidates could also refer to gaining information from paper documents or personal device theft (phone, laptops etc).

Question			Expected Answer(s)	Max Mark	Additional Guidance
8.			Expert	**1**	Candidate may imply expert. Accept examples like: • experienced • programmer • advanced • administrator.

Question			Expected Answer(s)	Max Mark	Additional Guidance
9.			All **three** bullets for 2 marks: • program loops/ program repeats lines 3 and 4 / program checks condition • a message is displayed • another temperature reading is taken Any **two** bullets for 1 mark. **One** or **zero** bullets, no marks.	**2**	Candidate can imply loop through an idea of repetition (for example - "until temperature is greater than 82" or "until" or "while") Note – Candidate must "explain" what the code does. If they simply copy the code into their answer they should not be awarded that bullet point.

Question			Expected Answer(s)	Max Mark	Additional Guidance
10.			Search or Query	**1**	

Question			Expected Answer(s)	Max Mark	Additional Guidance
11.			1. Compiler (1) 2. Interpreter (1)	**2**	Must also accept 'Interpreter' for the first answer as an interpreted program would stop to report an error and that would be "the end of translation".

Question			Expected Answer(s)	Max Mark	Additional Guidance
12.			One mark each for: • loop 16 times • input of time from user inside loop	**2**	No formal syntax is required as candidates can write answer in "pseudocode". For the concept of looping through elements of an array award 1 mark in place of 'loop 16 times'.

Question			Expected Answer(s)	Max Mark	Additional Guidance
13.			Description of **two** problems and improvements from poor navigation list below: • navigation in two different places • navigation not labelled correctly (buttons along top, 'radio buttons', 'check boxes', 'new' button, 'arrow' button) • no indication of which page (1,2,3,4,5) the user is currently on • no indication where login will take you **One** mark for each problem and improvement required. If candidate states two problems without improvements award **one** mark.	**2**	Could also include answers regarding aspects of good navigation missing from diagram: • search bar • breadcrumb • page heading Could also discuss the effectiveness of the user interface relating to navigation (for example icon size). Note – If candidate gives a solution and doing this implies where the problems are, award a mark (two such solutions = 2 marks).

Question			Expected Answer(s)	Max Mark	Additional Guidance
14.			Peer to Peer or P2P	**1**	Also allow "open" network.

Question			Expected Answer(s)	Max Mark	Additional Guidance
15.	(a)		Any **one** from • Route ID data value is not unique • Cannot identify one row in the table using Route ID data value	**1**	
	(b)		Any **two** problems from: • data duplication • inconsistency of data • update anomalies	**2**	Allow descriptions of terminology or consequences of a problem (for example, searching would be difficult).
	(c)		Relational (database) **OR** Linked (tables)	**1**	
	(d)		Text	**1**	
	(e)	(i)	Any **one** from • restricted (choice) • presence check	**1**	
		(ii)	Exceptional(1 mark): • any value less than 1 **or** • any value greater than 6 **or** • any real value • any example of text value Extreme(1 mark): • 1 **OR** • 6	**2**	
	(f)		Two fields in correct order with sorting direction • Price ascending • Depart ascending	**2**	Accept a description of ascending. Award 1 mark for two fields (with the correct direction) written in wrong order: "depart ascending then price ascending".

Question			Expected Answer(s)	Max Mark	Additional Guidance
16.	(a)		Design or code should include the following bullet points for 1 mark each: • loop • loop condition • user input, numTwo re-entered after condition (or within loop..until) • error message to user	**4**	Do not accept any condition as the condition must be correct in context of candidates answer. For example: If candidate uses a conditional loop the condition should be either: loop until - numTwo > numOne while loop - numTwo <= numOne) If candidate does not use a loop but uses an IF statement check then mark the IF condition. Check the condition carefully.
	(b)		Character (char)	**1**	Accept 'string' as you can store a string of 1 character.
	(c)		Output would be: "Correct it is in the middle"	**1**	Accept line 11.
	(d)		One mark for each: • Random (Number) • To generate a random value between two values **OR** • between a range **OR** • between limits	**2**	A correct description of the wrong pre-defined function should be awarded 1 mark. Accept program syntax for a random function such as: Randomint Rand Rnd Randnum RandInt Also accept Int or Round as the random number generated may be converted into an integer. One mark for function, one for description.
	(e)		Lines 3 to 17 (or 3 to 18) should be placed inside a loop (1 mark) Repeat 10 times (1 mark)	**2**	Accept candidate implying lines to be repeated, for example - "loop/repeat everything after line 2".

Question			Expected Answer(s)	Max Mark	Additional Guidance
17.	(a)		Hierarchical	**1**	
	(b)		Description or naming of • storyboard • wireframe	**1**	
	(c)		Description of function of hyperlink: • provides navigation through a website • click on hyperlink to move to another resource (page)	**1**	
	(d)	(i)	Video	**1**	Audio/Sound.
		(ii)	Looking for path and filename resources/dunk.gif	**1**	Must be written as an address. Do not accept: resources dunk.gif resources – dunk.gif Also accept ../resources/dunk.gif ./resources/dunk.gif resources\dunk.gif
	(e)	(i)	(hyper)link to another website	**1**	
		(ii)	Uniform Resource Locator	**1**	

Question			Expected Answer(s)	Max Mark	Additional Guidance
		(iii)	Calculating Resolution (1 mark) 7x600x5x600 Multiplying by Colour depth (1 mark) (12600000 x24) Convert to Megabytes (1 mark) /8/1024/1024 = 36.048 Megabytes	**3**	Correct answer with no working= 3 marks. Rounding answer to 36MB would be acceptable. Wrong answer with no working = 0 marks. If candidate makes only 1 error marks should be awarded for the remaining calculation being carried out correctly. Correct answer must contain "appropriate" units. Allow: 36914.1 kB 36.05 MB 0.035 GB Notes (common errors): If candidate multiplies 7x5x600x24 then answer is 61.52kB (0.06MB). 2 marks If candidate multiplies 7x5x600x600 then answer is 1538kB (1.502MB). 2 marks

Question			Expected Answer(s)	Max Mark	Additional Guidance
18.	(a)	(i)	Increase file size	**1**	
		(ii)	mp3	**1**	Candidates may give other compressed audio formats they are familiar with. Please check alternative answers and award a mark if correct. No marks for mp4 as this is a container file for storing video.
	(b)	(i)	Hacking **OR** Unauthorised access	**1**	No marks for "without permission" as this simply repeats question text.
		(ii)	Description of one other offence under CMA • Unauthorised access with intent to commit crime/further offences • Unauthorised modification of data	**1**	Accept spreading viruses and malware, but not writing viruses Note 1: If part (i) is answered incorrectly then 'hacking' or 'unauthorised access' could then be an acceptable answer for part (ii) as this would now be "another answer". Note 2: If candidate refers to a different act for part (i), part (ii) must still relate to the CMA.
	(c)		Communications Act	**1**	
	(d)	(i)	Graphics are owned by someone else **OR** Without permission he would break the Copyright, Designs & Patents Act	**1**	
		(ii)	Selection construct with appropriate condition(1 mark) • IF answer = A • IF answer = correct answer • IF question 3 = A Assignment to update totalscore variable (1 mark) • totalscore TO totalscore + 1 • add one to score • totalscore =+ 1	**2**	No formal syntax is required as candidates can write answer in "pseudocode". For example, use of '=', '==' or 'equals' would all be acceptable.

Question			Expected Answer(s)	Max Mark	Additional Guidance
	(e)		Any **two** for one mark each: • Right to view own personal data • Right to have own data corrected if incorrect • Right to seek compensation for damages caused by inaccurate information • Right to prevent data being used for direct marketing • Right to ask for data to be deleted (if it breaches the DPA principles)	**2**	If the candidate answers questions using a DPA principle but from the subjects point of view then also award a mark.

Question			Expected Answer(s)	Max Mark	Additional Guidance
19.	(a)		Array – 1 mark Of Real - 1 mark	**2**	
	(b)	(i)	Description includes reference to: • line 1 – total set to 0 • line 3 - loop • line 4 – each cost is added to previous total	**3**	
		(ii)	Mantissa – 1 mark Exponent – 1 mark	**2**	1 mark for 'floating point representation'.
		(iii)	A Accept any answer that would have explained the total being incorrect: • logic error • syntax error (DUE) • not recompiled code • program not saved before being re-run • program only calculates 5 costs • program has not been run • has not added on the 45.00 • line 3 has not been implemented correctly B 1 mark for stating how error could be corrected.	**1** **1**	

Question			Expected Answer(s)	Max Mark	Additional Guidance
			Additional - Error in question code There were errors in the code of this question and the Expected Answer(s) above are appropriate for the code as it was produced in the question paper. However, to help prepare for future examinations, the code should have read: Line 1 SET total = 0 Line 2 SET counter = 0 Line 3 DECLARE cost INITIALLY[35.00, 36.00, 40.00, 35.00, 42.50] Line 4 REPEAT Line 5 SET total = total + cost(counter) Line 6 SET counter = counter + 1 Line 7 UNTIL counter = 4 Line 8 SEND "The total cost = £"&total TO DISPLAY This would result in these Expected Answer(s): 19(b)(iii)(A) logic error counter only set to 4 program only calculates 5 costs 19(b)(iii)(B) candidate answer links to response to part (A): logic error – change the counter value counter only set to 4 – change to 5 allow for 6 values to be added	**1** **1**	With SQA reference language, indexing for both Array and String starts from zero. This is not the case in some other languages.
	(c)		Used to join text and variables together **OR** Output includes both text and variables together **OR** Used to join strings	**1**	Also accept joining variables to other variables. Also accept an example of concatenation.

Question			Expected Answer(s)	Max Mark	Additional Guidance
20.	(a)		Blocks attempts to access a device **OR** Filters incoming traffic	**1**	Accept blocks malware.
	(b)		Encryption encodes a file (1) so that it is unreadable (1) by others	**2**	Encoding could be implied by stating encrypted data: • requires a key • is meaningless.
	(c)	(i)	Any Input device from: • touch screen • digital camera • microphone Any Output device from: • (HD) display • speakers	**2**	
		(ii)	Any Interface type device from: • USB (3·0) • (Micro) HDMI • Headphone jack	**1**	
		(iii)	Any one for 1 mark from • Temporary storage of data • Handling of status signals • Data conversion – serial to parallel • Voltage conversion • Communication between devices	**1**	Do not accept "to connect two devices".
		(iv)	Two reasons for incompatibility (1 mark each) • OS version too old (4.1 needs 4.4 or higher) • Lack of storage(16 Gigabyte needs 32 Gigabyte)	**2**	

Question			Expected Answer(s)	Max Mark	Additional Guidance
	(d)		One reason that describes difference in interaction between user and device • Smartphone screen size much smaller so less room for text and menus to be displayed • Input device used to make selection is touch screen so need larger icons and text than can be selected using touch input • smartphone interface has fewer objects allowing for faster download to portable device	**1**	

Question			Expected Answer(s)	Max Mark	Additional Guidance
21.	(a)	(i)	Any one from: • Provides a visual representation which can be easier to understand • Illustrates flow of data/sequence of processes	**1**	
		(ii)	Input validation	**1**	
	(b)		IF/while (1 mark) numPlayers <=4 (1 mark) numGames <=3 (1 mark) or numPlayers <5 (1 mark) numGames <4 (1 mark)	**3**	No specific mark for use of AND as it is stated in the decision. No formal syntax is required as candidates can write answer in "pseudocode". For example, use of '<=' and '=<' or 'less than or equal to' would all be acceptable.
	(c)	(i)	**Test Data Type** / **Expected Result** Normal / Booking accepted **Extreme** / Booking accepted **Exceptional** / **Not valid number of players**	**3**	Allow Normal for first answer as extreme test data is a sub-set of normal test data.
		(ii)	Run time/Execution error	**1**	

Question			Expected Answer(s)	Max Mark	Additional Guidance
	(d)		Any **one** from: • Internal commentary • Meaningful identifiers • Indentation/white space • Highlight keywords • Modular code	**1**	

[END OF MARKING INSTRUCTIONS]