National Qualifications 2016

Computing Science

Higher

Finalised Marking Instructions

General Marking Principles for Higher 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 features required in candidate responses.

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

(b) Marking should always be positive, ie marks should be awarded for what is correct and not deducted for 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.

(d) Marks should be awarded regardless of spelling as long as the meaning is unambiguous.

(e) Candidates may answer programming questions in any appropriate programming language or pseudocode. Marks should be awarded, regardless of minor syntax errors, as long as the intention of the coding is clear.

(f) Where a question asks the candidate to **describe**, the candidate must provide a statement or structure of characteristics and/or features. This should be more than an outline or a list. It may refer to, for instance, a concept, process, experiment, situation or facts in the context of, and appropriate to, the question. The candidates will normally be required to make the same number of factual/appropriate points as are awarded in the question.

(g) Where a question asks the candidate to **explain**, marks should only be awarded where the candidate goes beyond a description, for example by giving a reason, or relating cause to effect, or providing a relationship between two aspects. These will be related to the context of the question or a specific area within a question.

Detailed Marking Instructions for each question

Section 1

Question			Expected Answer(s)	Max Mark	Additional Guidance
1.			• Precision will decrease **(1)** • Range will increase **(1)**	**2**	1 mark per bullet point
2.			95*24 *1280*720*16 = 3·91387939 Gb	**2**	1 mark for correct multiplication 1 mark for correct conversion If first line not correct, check conversion Accept rounding to 4Gb
3.			Concept of inheritance **(1)** Only additional methods and attributes need to be declared for subclasses **(1)**	**2**	Reducing the amount of code must be aligned with additional methods and attributes for the 2nd mark.
4.			• Rapid Application Development uses minimal planning/reduced analysis • Rapid Application Development involves the creation of prototypes/working software as soon as possible • In Rapid Application Development, the planning and design of a project happens concurrently with the Implementation of the project • Rapid Application Development allows users to feedback during all stages of the development process • Rapid Application Design allows changes to the design to be made at any time throughout the life of the project in response to client feedback	**2**	1 mark per bullet point Max 2 marks Do not award a mark for **no** planning required.

Question			Expected Answer(s)	Max Mark	Additional Guidance
5.			• Radio buttons/drop down/ restricted choice menu for membership • Calendar for DOB • Member ID automatically generated; use Autonumber for Member ID • Button to submit data	2	1 mark per bullet point Any other acceptable answer
6.			• Pupils have read only access to this folder **(1)** • Teachers have read/write access to this folder **(1)**	2	Concept of different access rights – 1 mark
7	(a)		No single field provides a unique value **OR** All three fields required to provide a unique value	1	"unique" on its own is insufficient
	(b)		• Field/data type • Keys / PK/FK • Validation • Field length/size • Format • Required • Unique • Sample data • Table name	2	Any two bullet points, 1 mark each Indication of PK/FK together
8.	(a)		• Head tag isn't closed • H1 tag in head/title • Centre should be center • P1 should be p	2	1 mark for each bullet point, max 2 marks
	(b)	(i)	• To provide a description of the webpage • To provide information to search engine (webcrawlers) • To include key words • To provide information about page creation date/last edit date/author's details etc	1	1 mark for any acceptable answer
		(ii)	In the head section	1	

Question			Expected Answer(s)	Max Mark	Additional Guidance
9.			Greater demand • for raw materials • transportation of materials • electricity/energy for manufacture and use Disposal • transporting old computers to the dump • poisonous chemicals contained within computer components can contaminate water and air • landfill sites	1	Answer must refer to manufacture, use or disposal of technology.

Section 2

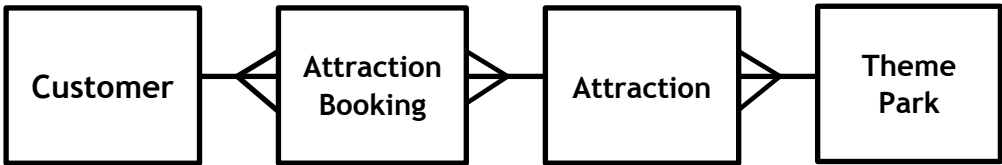| Question			Expected Answer(s)	Max Mark	Additional Guidance

10.	(a)		SET total TO 0
			FOR counter FROM 0 TO 5 DO
			   IF SDD[counter] = "B" AND ISDD[counter] = "B" THEN
			      SET total TO total + 1
			   END IF
			END FOR
			SEND ("The total number of pupils attaining a B in both tests was " & total) TO DISPLAY
			
			Visual Studio
			Set total to 0
			For counter = 0 To 5
			  IF SDD[counter] = "B" AND ISDD[counter] = "B" Then
			    lstresults.Items.Add(pupil(counter))
			    total = total + 1
			  End If
			Next
			lstresults.Items.Add("The total number of pupils achieving a B in both tests was ")
			lstresults.Items.Add(total)
				5	1 mark for initialising total
					
					1 mark for use of fixed loop (with end loop or indentation)
					
					1 mark for complex IF (with end if or indentation)
					
					1 mark for indicating array () for correct variables within loop. Do not accept a fixed value.
					
					1 mark for incrementing total
					
					Accept length of array or length of array -1
					
					Allow alterative solutions that are fully correct eg concatenated grades

	(b)		• (Data flow is clearer so) code is more readable/easier to maintain • Portability is improved as code can be reused (without altering variable names) • Aids modularity • Reduces clashes between variable names • Reduces impact or load on main memory • Any other valid	2	
	(c)		• Makes a copy of the array • Increases the number of processing instructions • Increases RAM requirements	2	1 mark for stating a copy is made 1 mark for either effect on processor or RAM Do not accept more storage required
	(d)		• Returns a single value (used in assignment)	1	Do not accept other expressions of modular eg block of code

Question			Expected Answer(s)	Max Mark	Additional Guidance
	(e)	(i)	• Inform employees of access to digital communication • Provide access/encryption keys to authorised authorities/ bodies/personnel • Have facilities to store digital communications • Have facilities/software to monitor digital communications	2	Digital communication/data Providing encryption keys is a form of access and cannot be treated as a separate answer. Surveillance must relate to digital communications. CCTV etc is not relevant.
		(ii)	Description involving: • Freedom of speech • Privacy	2	One description from each bullet for 2 marks OR Two different examples relating to Freedom of Speech/Privacy for 1 mark each OR Freedom of Speech/Invasion of privacy (1) with an example (1)
11.	(a)		Links to additional pages from Tour Dates, Band Members or Fans pages	1	Any reasonable answer that adds page(s) on another level
	(b)		Client-side (scripting)	1	Accept by the browser
	(c)	(i)	H1 {font-family:Tahoma; color:blue; text-align:center}	3	1 mark for H1 OR H2 or H3 and {} 1 mark for correct element with appropriate attribute – maximum 2 marks Do not accept colour or centre Candidate may define a class eg .largeHeading. Award mark.
		(ii)	• One change to the style sheet will change all pages • One style sheet can be applied to multiple pages reducing development time • You can create classes of styles that can then be used on many different HTML elements • Consistent look and feel across multiple web pages • Improve load times because downloaded once • Can be set up for different devices/sizes of screen • Style sheet stored once rather than for multipile pages reducing overall file size.	2	Any two bullets, 1 mark each

Question			Expected Answer(s)	Max Mark	Additional Guidance
	(d)		• The URL should include China Cats or electropop (or both) • The title of each page should include China Cats or electropop (or both) • Meta tags/meta data with appropriate key words eg. China Cats and electropop • ensuring there are more links to the site from other sites; • improving the rating given to the site by the search engine crawler • Submit the website to search engines • Keyword loading/stuffing -add more relevant text content to webpages	2	1 mark for each bullet point, max 2 marks
	(e)		Customer knows • Digital signature/ encryption • Site is authenticated eg. certificate issued by (certification) authority • Site is regulated	2	1 mark for each bullet point, max 2 marks Do not accept Secure on its own – must say what makes the site secure

Question			Expected Answer(s)	Max Mark	Additional Guidance
12.	(a)		• Open source provides support via a community of users/ developers • Open source code can be modified/edited • Open source is normally free • Proprietary support is provided by the company who produced it • Proprietary is sometimes free • Emma may already be familiar with the user interface of proprietary software from previous versions. Any valid response	**2**	1 mark for correct bullet point from open source 1 mark for correct bullet point from proprietary Proprietary doesn't always incur a cost Answer must be a benefit to Emma
	(b)		• Set up a Virtual Machine • This will allow a host operating system to run another operating system	**2**	
	(c)	(i)	• Increasing the number of samples per second. • Increasing the number of bits per sample (increasing the range of sounds)	**2**	1 mark for each bullet point Accept a concept of leading to a greater range of sounds for 1 mark
		(ii)	• Removes frequencies not heard by humans • Removes the quieter of two simultaneous sounds • Very low frequencies are stored as mono rather than stereo	**1**	1 mark for any bullet point
	(d)		• The address bus stores/carries/holds the address of the memory location of the data (currently being accessed/read from) • The data bus transfers data to the processor/register	**2**	1 mark for each bullet point The address bus does not assign an address.

Question			Expected Answer(s)	Max Mark	Additional Guidance
13.	(a)		A=71 B=false C=true D=false	**4**	
	(b)	(i)	• Resets found to false for every non-matching item. • Continues looping after target found.	**1**	Any one bullet for 1 mark
		(ii)	Remove lines 7 and 8 **OR** Use a conditional loop until found is true(or end of list)	**1**	
	(c)		• The code for the loop/array values will be present in cache **(1)** • meaning faster access than going to slower main memory **(1)**	**2**	

Question			Expected Answer(s)	Max Mark	Additional Guidance
14.	(a)		• Real time update of available tickets/e-commerce • Dynamic pages can load user specific content (accept examples) • Ability to create queries/gain feedback or requests for information from users via forms	**2**	Any two bullets for 1 mark each. Maximum 2 marks. Any other valid answer
	(b)		• Query/script/search for ticket or weather • Criteria : ○ date 3rd June ○ log in details eg . user name and password ○ geographical location for weather ○ number of tickets • Compare tickets requested with tickets available • Returns ○ the message (if the number of tickets requested is not available) ○ user's name ○ current weather which is used to select appropriate weather graphic.	**4**	1 mark available for the concept of a query Maximum 2 marks from criteria 1 mark for comparison 1 mark for a return **Maximum 4 marks**
	(c)			**3**	
			  One mark for each correct relationship		
	(d)	(i)	• Risk of data loss	**1**	

Question			Expected Answer(s)	Max Mark	Additional Guidance
		(ii)	• Increase the frequency of backing up (1) by doing differential/incremental back ups (1) • Make differential backup (1) saving changes since last full backup (1) • Make incremental backups (1) saving changes since last backup of any type(1)	2	One bullet point for 2 marks, maximum 2 marks Increase frequency/daily back-ups without further description, 1 mark Any other valid backup strategy eg mirror
	(e)		The data protection act **(1)** makes it an offence to share data without the data subject's consent **(1)**	2	

Question			Expected Answer(s)	Max Mark	Additional Guidance
15.	(a)		DECLARE athletes[7] As athleteData	2	1 mark for data type as athleteData 1 mark for an array of 8 values assigned to variable **athletes**
	(b)		DECLARE athletes[] INITIALLY athleteData ("Salma", "Hussain", 324, True, 45.12, 67·5) **OR** SET athletes[] TO athleteData ("Salma", "Hussain", 324, True, 45.12, 67·5) **OR** athletes().forename = "Salma" athletes().surname = "Hussain" athletes().runnerNumber = 324 athletes().professional = True athletes().seasonBest = 45.12 athletes().weight = 67.5	3	1 mark for use of array eg. athletes() (accept appropriate name or name candidate declared in (a)) 1 mark for use of athleteData as a data type NOT a variable 1 mark for correct values in correct order or values related to the field name Accept answers in a high level language or pseudocode • Array eg. athletes() • Field Names eg. .forename • Assignment of value
	(c)		Line 1 SET minimum TO athletes[0].seasonBest Line 2 FOR counter FROM 1 TO 7 DO Line 3 IF athletes[counter].seasonBest < minimum THEN Line 4 minimum = athletes[counter].seasonBest Line 5 END IF Line 6 END FOR	5	For five marks: • 1 mark for assignment of minimum before loop • 1 mark for use of seasonBest as a field to access record at least once • 1 mark for correct If construct with correct condition (with end if or indentation) • 1 mark for assignment of minimum using the array() • 1 mark for correct loop construct (with end loop or indentation) Allow indexing from 1 or 0
	(d)	(i)	To create a file called 'winner' inside the folder MyAthletes on the C drive	1	1 mark for creating a file
		(ii)	To write the fastest time to the file called winner.txt	1	1 mark for writing to file (accept sending)

Question			Expected Answer(s)	Max Mark	Additional Guidance
	(e)		1st mark for naming a technique: • Dry Run • Breakpoint 2nd mark for related description Dry Run Manual run through of code often involving a pen and paper to try to identify errors Breakpoint • Stop the program **OR** • Inspect the value of variables	**2**	

[END OF MARKING INSTRUCTIONS]