National
Qualifications
2023

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 features required in candidate responses.

(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) Always use positive marking. This means candidates accumulate marks for the demonstration of relevant skills, knowledge and understanding; marks are not deducted.

(c) If a candidate response is not 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) Award marks regardless of spelling, as long as the meaning is unambiguous. This applies to all responses, including code.

(e) Award marks as per the detailed marking instructions, regardless of minor syntax errors.

(f) For questions where candidates are asked to design or write code, a sample response may be shown in the detailed marking instructions. This will not be the only valid response. You must use the detailed marking instructions and additional guidance to ensure that you consider alternative approaches and nuances of different programming languages. If in doubt you should refer to your Team Leader.

(g) A correct response can be negated if the candidate includes an extra, incorrect response which demonstrates that they do not know the correct answer. For example, in a state question where the only correct answer is 'white' and the candidate answers 'white orange', the mark should not be awarded.

(h) If a candidate puts a score through their entire response to a question and makes a further attempt, you should only mark the further attempt. If no further attempt is made and the original is legible, you should mark the original response.

(i) Where an incorrect response is carried forward and used correctly in a following part of the question, you should give credit for subsequent responses that are correct with regard to the original error. Candidates should not be penalised more than once for the same error.

(j) Only award marks for a valid response to the question asked. Where candidates are asked to:

- **Identify**, **name**, **give** or **state,** they need only name or present in brief form.
- **describe**, they must provide a statement or structure of characteristics and/or features. This will be more than an outline or a list. It may refer to, for example, a concept, process, experiment, situation, or facts, in the context of and appropriate to the question. Candidates must make the same number of factual/appropriate points as there are marks available in the question.
- **explain**, they must relate cause and/or effect and/or make relationships between things clear, in the context of the question or a specific area within the question.
- **write code,** they must write recognisable code, not prose nor a diagram.
- **design,** they must use a design technique appropriate to the problem. Award marks as per the detailed marking instructions, regardless of errors in the exemplification of the technique, if the intention of the design is clear.

(k) In the detailed marking instructions, if a word is underlined then it is essential; if a word is in brackets() then it is not essential. Words separated by / are alternatives.

Marking instructions for each question

Section 1 – Software design and development, and Computer systems

Question			Expected response	Max mark	Additional guidance
1.	(a)		One mark each for the following attributes: • x co-ordinate • y co-ordinate • fill colour • line colour	**2**	Also allow: • line thickness • fill pattern • number of sides • length of (polygon) side • (angle of) rotation • layer • transparency/opacity • coordinates
	(b)		One mark for any one from: • ellipse • line • text	**1**	Do not allow "oval" or "circle" in place of ellipse.
2.			Encryption	**1**	Accept a description of encryption.
3.			One mark each for: • settings on monitors • power down when not in use	**2**	Do not accept "stand by" or "sleep". Also accept: • power settings • reduce clock speed • reduce refresh rate of screen • reduce running applications • remove external devices
4.			One mark each for: • Extreme: – 1 or 7 • Exceptional: – any number <1 or >7 – any character/symbol – any real number	**2**	
5.			Flowchart	**1**	Flow Diagram
6.	(a)	(i)	48(bits)	**1**	
		(ii)	Register(s)	**1**	
	(b)		length or len	**1**	Not "length check"
7.	(a)		One mark each for: • type logic • fix – change < to > – swap lines 21 and 23	**2**	Allow "swap output messages"
	(b)		ALU	**1**	Arithmetic Logic Unit

Question			Expected response	Max mark	Additional guidance

8.	(a)		One mark for the following code:
			
			• calculation of small windows cost
			• calculation of large windows cost
			• running total updated
			• assignment to totalCost
				4	Sample one line answer:
					
					`SET totalCost TO totalCost + (numSmall * 299.99) + (numLarge * 499.99)`
					
					Sample three line answer:
					
					`SET small TO numSmall * 299.99`
					`SET large TO numLarge * 499.99`
					`SET totalCost TO totalCost + small + large`

	(b)		One mark for the following code: • display the correct text using quotes • `totalCost` variable used between text with appropriate separators	**2**	Example answers can include: `SEND "The cost is £" & totalCost & " for the windows" TO DISPLAY`
	(c)		01110010	**1**	
9.	(a)		One mark each for: • three inputs – score (for each hole) – name – date • output – total score	**2**	Do not penalise any additional answers for input and output.
	(b)		One mark each for any two from: • no next hole button/enter • no zero button • no submit button • no delete/backspace to delete score	**2**	
	(c)		One mark for the following code: • if (statement) • correct condition - score >= par + 3 • par + 2 assigned	**3**	Alternative conditions could include: • score > par + 2 • score - 2 > par • score – 3 >= par
	(d)		One mark each for: • data structure - (1-D) array • data type - integer	**2**	
	(e)		One mark each for: • each pixel • is stored as a binary value (bits)	**2**	

Question			Expected response	Max mark	Additional guidance
10.	(a)		One mark each for the order shown: • 357 • 2	**2**	
	(b)		One mark for each of the following designed: • loop 12 times • updating running total within loop • using stored array values • calculate average total/12	**4**	Example answer: 2.1 Loop 12 times 2.2 Set total to total month [index] 2.3 End loop 2.4 Set aveData to total/12 Award mark if average divides by the same number of loop iterations.
	(c)		One mark each for: • round() function • correct parameters aveData,1	**2**	Display/print/assignment not required in answer as given in question. Example answer: `round(aveData,1)`
	(d)	(i)	AND	**1**	
		(ii)	One mark each for: • type - Syntax • fix 'cust' and 'Discount' variable corrected (to custDiscount	**2**	

<table>
<tr><th colspan="3">Question</th><th>Expected response</th><th>Max mark</th><th>Additional guidance</th></tr>
<tr><td>11.</td><td>(a)</td><td></td><td>Any one of the following:
• find winning representative
• add votes/running total for each candidate
• validate the input</td><td>1</td><td>Answer should relate to scenario.
Do not allow:
• calculate total number of votes</td></tr>
<tr><td></td><td>(b)</td><td>(i)</td><td>Character or Char</td><td>1</td><td>Do not allow string as question states “most suitable”</td></tr>
<tr><td></td><td></td><td>(ii)</td><td>One mark for each design of input validation showing:

• conditional loop
• correct loop condition for valid data
• input of vote inside loop
• error message displayed within appropriate if/loop conditions</td><td>4</td><td>If the loop is missing the start/end of the loop assume that everything above or below the start/end is inside the loop.

While
= NOT (A or B or C or D)
= NOT (A) and NOT (B) and NOT (C) and NOT (D)

Until
= A or B or C or D</td></tr>
<tr><td></td><td>(c)</td><td></td><td>One mark each for the following in the correct order:

• compiler
• interpreter</td><td>2</td><td><table><tr><th>Type of translator</th><th>Result</th></tr><tr><td>compiler</td><td>Loop on line 22-24 will be translated once and converted into machine code</td></tr><tr><td>interpreter</td><td>Loop on line 22-24 will be translated multiple times as the program is run</td></tr></table></td></tr>
<tr><td></td><td>(d)</td><td></td><td>One mark for the following code:

• random
• correct parameters
• random number used as <code>winners</code> array index</td><td>3</td><td>Accept programming language specific versions of random.

Example SQARL answers:

<code>SEND winners[RANDOM(0,2)]
TO DISPLAY</code>

or

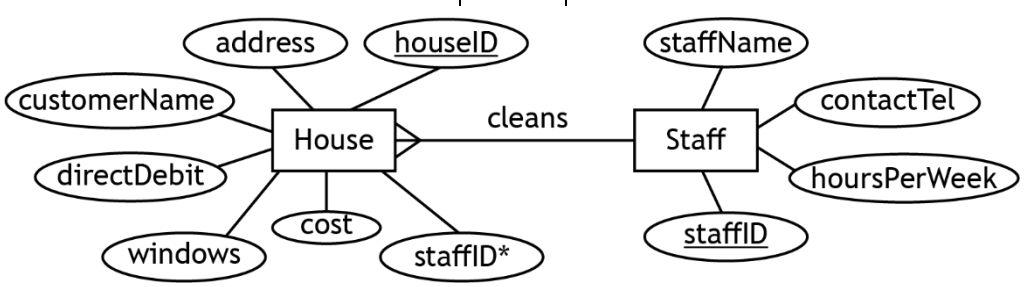
<code>index = RANDOM(0,2)
SEND winners[index] TO DISPLAY</code></td></tr>
</table>

Section 2 – Database Design and Development

<table>
<tr><th colspan="3">Question</th><th>Expected response</th><th>Max mark</th><th>Additional guidance</th></tr>
<tr><td>12.</td><td>(a)</td><td></td><td>Restricted Choice</td><td>1</td><td></td></tr>
<tr><td></td><td>(b)</td><td></td><td>One mark each for:
• Boolean
• date</td><td>2</td><td><table><tr><th>Attribute</th><th>Attribute Type</th></tr><tr><td>personalise</td><td>Boolean</td></tr><tr><td>collection</td><td>Date</td></tr></table></td></tr>
<tr><td>13.</td><td></td><td></td><td>One mark each for:

• first sort
– storage (ASC)
• second sort
– contractLength DESC</td><td>2</td><td>Do not award second sort if first sort is missing.

Second sort mark can still be awarded if first sort is incorrect.

Ignore syntax errors, for example using AND instead of a comma.</td></tr>
<tr><td>14.</td><td>(a)</td><td></td><td>One mark each for:
• M-1 relationship
• naming the relationship
• adding staffID to house entity
• FK staffID in house entity
 
</td><td>4</td><td>See diagram below.</td></tr>
<tr><td></td><td>(b)</td><td>(i)</td><td>One mark for the following SQL code:
• <code>SELECT customerName, address</code>
• <code>FROM House, Staff</code>
• <code>WHERE windows >=5</code>
• <code>AND staffName = "Fatima Khan"</code>
• <code>AND House.staffID = Staff.staffID</code></td><td>5</td><td>SELECT
• fields can be in any order
• do not award a mark if additional fields have been included

FROM
• table names can be in any order

WHERE
• conditions can be in any order
• second/third conditions must include AND</td></tr>
<tr><td></td><td></td><td>(ii)</td><td>customerName = "Sue Horaz"</td><td>1</td><td></td></tr>
<tr><td></td><td>(c)</td><td></td><td>One mark for:
• staffID (3630) is not present in the Staff/other table</td><td>1</td><td>Do not accept ‘referential integrity’ as written in the graphic.</td></tr>
</table>

<table>
<tr><th colspan="3">Question</th><th>Expected response</th><th>Max mark</th><th>Additional guidance</th></tr>
<tr><td>15.</td><td>(a)</td><td></td><td>One mark each for:
• parentName, email with no other fields
• Class, Booking
• sessionBlock = Spring
• classAge = Babies</td><td>4</td><td>Field(s)
• fields can be in any order

Table(s)
• table names can be in any order

Search Criteria
• conditions can be in any order

<table><tr><td>Field(s)</td><td>parentName, email</td></tr><tr><td>Table(s)</td><td>Class, Booking</td></tr><tr><td>Search Criteria</td><td>sessionBlock=Spring
classAge = Babies</td></tr></table></td></tr>
<tr><td></td><td>(b)</td><td></td><td>One mark for the following SQL code:
• INSERT INTO Booking
• Correct VALUES</td><td>2</td><td>Field names not required in INSERT

<pre>INSERT INTO Booking
VALUES("TR653726","Tim
Roberts",
"TRoberts2@mail.com" , "Luc
as" , 05/02/2023, No, "B1-
497");</pre>
Notes:
• Date may be
– '2023/02/05'
– #05/02/2023#
– "05/02/2023"
– '05/02/2023'
• No may be 0, False or assumed to be text "No"</td></tr>
<tr><td></td><td>(c)</td><td>(i)</td><td>All Claire’s ‘3-4 Years’ classes are removed.</td><td>1</td><td>Accept that it deletes more than one record.

Accept that it also deletes Friday’s class.

Do not accept that it deletes all of Claire’s records.</td></tr>
<tr><td></td><td></td><td>(ii)</td><td>One mark for the following SQL code
• <pre>DELETE FROM CLASS</pre>
• <pre>WHERE location =
"Gorebridge"</pre></td><td>2</td><td></td></tr>
</table>

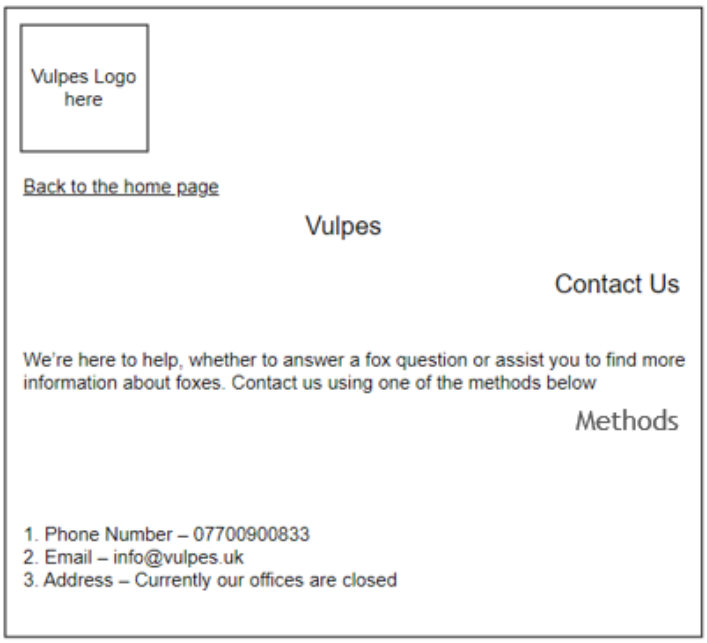
Section 3 – Web Design and Development

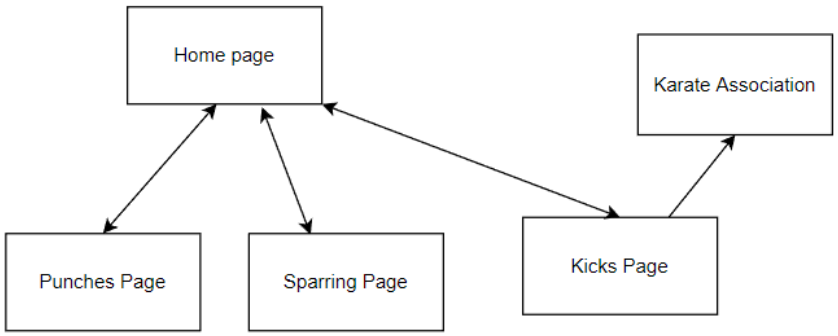
Question			Expected response	Max mark	Additional guidance
16.	(a)		One mark each for any two from: • name missing • buy button missing • price missing	**2**	
	(b)		Links to another page/location within the same website.	**1**	
17.	(a)		gif	**1**	Accept other file types that allow animation.
	(b)		One mark for any one from: • (the creator) can give/refuse permission to use the images • (the creator) can ask to be paid for their images • (the creator) is protected against someone taking credit for their images	**1**	Answers must relate to the creator of the images.
18.			One mark for any one from: • ensures consistency across the website • all connected pages are changed when edits are made to the CSS • reduces time required to style multiple pages as CSS only needs to be written once • improves the readability of HTML/CSS/code (to another coder/screenreader)	**1**	Looking for a description of a benefit, not just a fact. Do not accept 'consistency' on its own.

Question			Expected response	Max mark	Additional guidance
19.	(a)		One mark for any one from: The website must • display the charity logo • play sounds of foxes • display pictures of foxes	**1**	Answer must refer to scenario.

	(b)	(i)	One mark for each from:
			• audio opening and closing tags
			• pathname
			• filename and type
				3	`<audio controls>`
					`<source src=`
					`"media/redFoxCry.mp3"`
					`type="audio/mpeg">`
					`</audio>`

		(ii)	The sample rate/frequency of the file may be reduced	**1**	Only accept compression if the answer indicates that the mp3 file is being further compressed.
	(c)		One mark each for: • JavaScript • (on) mouseover	**2**	
	(d)		One mark each of the following in the correct positions: • "Vulpes" • "Contact Us" • "Methods"	**3**	Refer to diagram below for positions.



Question			Expected response	Max mark	Additional guidance
20.	(a)		**Wireframe** - One mark from: • to show the layout of the website **Low fidelity prototype** - One mark from: • to show the (complete) content and layout of the website • to show the intended user interface to client • it allows end-users to get the look and feel of a website • allows client to give feedback	**2**	
	(b)		One mark each for: • home, kicks, punches and sparring pages • double headed arrows from home to other internal pages • foot sweep demo/Karate Association page • one-way navigational arrow from kicks page to external page  	**4**	See diagram below.

	(c)		One mark each for:
			
			CSS rule
			• class selector
			• color:red
			
			Edited HTML
			• HTML rewritten to apply CSS rule
				3	Example Code:
					(class name may be different)
					
					<u>CSS</u>
					`.focus{color:red}`
					
					<u>HTML</u>
					`<h3 class="focus">Lunge Punch</h3>`

[END OF MARKING INSTRUCTIONS]