

# Mark Scheme (Results)

June 2015

Pearson Edexcel  
GCSE Computer Science (1CP0/01)  
Paper 1: Principles of Computer Science

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## General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

| Question Number      | Answer  | Additional Guidance | Mark   |         |        |         |          |  |  |   |  |                 |   |  |  |  |       |  |  |  |   |                    |  |   |  |  |                      |  |  |  |   |                 |   |  |  |  |  |          |
|----------------------|---|---------------------|--------|---------|--------|---------|----------|--|--|---|--|-----------------|---|--|--|--|-------|--|--|--|---|--------------------|--|---|--|--|----------------------|--|--|--|---|-----------------|---|--|--|--|--|----------|
| <b>1(a)</b>          | <p>1 or 2 correct = 1 mark<br/>           3 or 4 correct = 2 marks<br/>           5 or 6 correct = 3 marks</p> <table border="1"> <thead> <tr> <th></th> <th>Input</th> <th>Process</th> <th>Output</th> <th>Neither</th> </tr> </thead> <tbody> <tr> <td>Actuator</td> <td></td> <td></td> <td>x</td> <td></td> </tr> <tr> <td>Infrared Sensor</td> <td>x</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Wheel</td> <td></td> <td></td> <td></td> <td>x</td> </tr> <tr> <td>Calculate Distance</td> <td></td> <td>x</td> <td></td> <td></td> </tr> <tr> <td>Programming Language</td> <td></td> <td></td> <td></td> <td>x</td> </tr> <tr> <td>Movement Sensor</td> <td>x</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> |                     | Input  | Process | Output | Neither | Actuator |  |  | x |  | Infrared Sensor | x |  |  |  | Wheel |  |  |  | x | Calculate Distance |  | x |  |  | Programming Language |  |  |  | x | Movement Sensor | x |  |  |  |  | <b>3</b> |
|                      | Input   | Process             | Output | Neither |        |         |          |  |  |   |  |                 |   |  |  |  |       |  |  |  |   |                    |  |   |  |  |                      |  |  |  |   |                 |   |  |  |  |  |          |
| Actuator             |   |                     | x      |         |        |         |          |  |  |   |  |                 |   |  |  |  |       |  |  |  |   |                    |  |   |  |  |                      |  |  |  |   |                 |   |  |  |  |  |          |
| Infrared Sensor      | x   |                     |        |         |        |         |          |  |  |   |  |                 |   |  |  |  |       |  |  |  |   |                    |  |   |  |  |                      |  |  |  |   |                 |   |  |  |  |  |          |
| Wheel                |   |                     |        | x       |        |         |          |  |  |   |  |                 |   |  |  |  |       |  |  |  |   |                    |  |   |  |  |                      |  |  |  |   |                 |   |  |  |  |  |          |
| Calculate Distance   |   | x                   |        |         |        |         |          |  |  |   |  |                 |   |  |  |  |       |  |  |  |   |                    |  |   |  |  |                      |  |  |  |   |                 |   |  |  |  |  |          |
| Programming Language |   |                     |        | x       |        |         |          |  |  |   |  |                 |   |  |  |  |       |  |  |  |   |                    |  |   |  |  |                      |  |  |  |   |                 |   |  |  |  |  |          |
| Movement Sensor      | x   |                     |        |         |        |         |          |  |  |   |  |                 |   |  |  |  |       |  |  |  |   |                    |  |   |  |  |                      |  |  |  |   |                 |   |  |  |  |  |          |

| Question Number | Answer   | Additional Guidance | Mark     |
|-----------------|--|---------------------|----------|
| <b>1(b)</b>     | <ul style="list-style-type: none"> <li>• Data (1)</li> <li>• Instructions (1)</li> </ul> |                     | <b>2</b> |

| Question Number | Answer  | Additional Guidance | Mark     |
|-----------------|---|---------------------|----------|
| <b>1(c)(i)</b>  | <ul style="list-style-type: none"> <li>• 121</li> </ul> |                     | <b>1</b> |

| Question Number | Answer  | Additional Guidance | Mark     |
|-----------------|---|---------------------|----------|
| <b>1(c)(ii)</b> | <ul style="list-style-type: none"> <li>• 122</li> </ul> |                     | <b>1</b> |

| Question Number  | Answer  | Additional Guidance | Mark     |
|------------------|---|---------------------|----------|
| <b>1(c)(iii)</b> | <ul style="list-style-type: none"> <li>• Any one of: <ul style="list-style-type: none"> <li>○ IF (statement)</li> <li>○ IF...THEN.....ELSE</li> <li>○ Selection</li> <li>○ Conditional</li> </ul> </li> </ul> <p><b>If unsure, please send it to review</b></p> |                     | <b>1</b> |

| Question Number | Answer   | Additional Guidance | Mark |   |   |   |   |   |   |  |          |
|-----------------|--|---------------------|------|---|---|---|---|---|---|--|----------|
| <b>1(d)</b>     | <table border="1"> <tr> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>1</td> <td>0</td> <td>0</td> </tr> </table> | 0                   | 0    | 0 | 0 | 1 | 1 | 0 | 0 |  | <b>1</b> |
| 0               | 0  | 0                   | 0    | 1 | 1 | 0 | 0 |   |   |  |          |

| Question Number | Answer   | Additional Guidance | Mark |   |   |   |   |   |   |  |          |
|-----------------|--|---------------------|------|---|---|---|---|---|---|--|----------|
| <b>1(e)</b>     | <table border="1"> <tr> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>0</td> <td>0</td> <td>1</td> <td>0</td> </tr> </table> | 1                   | 1    | 1 | 1 | 0 | 0 | 1 | 0 |  | <b>1</b> |
| 1               | 1  | 1                   | 1    | 0 | 0 | 1 | 0 |   |   |  |          |

| Question Number | Answer   | Additional Guidance | Mark |   |   |   |   |   |   |  |          |
|-----------------|--|---------------------|------|---|---|---|---|---|---|--|----------|
| <b>1(f)(i)</b>  | <table border="1"> <tr> <td>1</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> </tr> </table> | 1                   | 0    | 0 | 0 | 0 | 0 | 0 | 1 |  | <b>1</b> |
| 1               | 0  | 0                   | 0    | 0 | 0 | 0 | 1 |   |   |  |          |

| Question Number | Answer   | Additional Guidance   | Mark     |
|-----------------|--|---|----------|
| <b>1(f)(ii)</b> | <ul style="list-style-type: none"> <li>• The result of the calculation cannot fit into the size of the location assigned to hold it</li> <li>• Two 8-bit numbers added together resulted in a number that could not be stored in 8 bits</li> <li>• The addition resulted in a number <math>\geq 1\ 0000\ 0000</math> binary (note the overflow out of the destination field)</li> <li>• The result is <math>&gt;255</math></li> <li>• The result needs 9-bits to store it</li> </ul> | Do not accept - the number is too big - without further explanation | <b>1</b> |

| Question Number  | Answer   | Additional Guidance   | Mark     |
|------------------|--|---|----------|
| <b>1(f)(iii)</b> | <ul style="list-style-type: none"> <li>• Introduces errors in subsequent calculations</li> <li>• Compounds errors in subsequent calculations; snowballs</li> <li>• Signed numbers may change sign</li> <li>• Any indication that arithmetic performed on inaccurate calculated numbers results in subsequent inaccurate results</li> </ul> | <ul style="list-style-type: none"> <li>• Ignore examples</li> </ul> | <b>1</b> |

| Question Number | Answer  | Additional Guidance | Mark   |   |   |   |   |  |          |
|-----------------|---|---------------------|--------|---|---|---|---|--|----------|
| <b>1(g)</b>     | <ul style="list-style-type: none"> <li>• Table or any other suitable notation</li> </ul> <table border="1"> <thead> <tr> <th>Input</th> <th>Output</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>1</td> </tr> <tr> <td>1</td> <td>0</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>• NOT (0) == 1</li> <li>• NOT (1) == 0</li> </ul> | Input               | Output | 0 | 1 | 1 | 0 |  | <b>1</b> |
| Input           | Output  |                     |        |   |   |   |   |  |          |
| 0               | 1   |                     |        |   |   |   |   |  |          |
| 1               | 0   |                     |        |   |   |   |   |  |          |

| Question Number | Answer   | Additional Guidance | Mark |   |   |   |   |   |   |   |   |  |          |
|-----------------|--|---------------------|------|---|---|---|---|---|---|---|---|--|----------|
| <b>1(h)(i)</b>  | <ul style="list-style-type: none"> <li>• NOT R column correct = 1 mark</li> <li>• First 2 rows correct of Q = 1 mark</li> <li>• Last 2 rows of Q = 1 mark</li> </ul> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>NOT R</th> <th>Q</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0</td> </tr> <tr> <td>1</td> <td>1</td> </tr> <tr> <td>0</td> <td>0</td> </tr> <tr> <td>0</td> <td>0</td> </tr> </tbody> </table> | NOT R               | Q    | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |  | <b>3</b> |
| NOT R           | Q  |                     |      |   |   |   |   |   |   |   |   |  |          |
| 1               | 0  |                     |      |   |   |   |   |   |   |   |   |  |          |
| 1               | 1  |                     |      |   |   |   |   |   |   |   |   |  |          |
| 0               | 0  |                     |      |   |   |   |   |   |   |   |   |  |          |
| 0               | 0  |                     |      |   |   |   |   |   |   |   |   |  |          |

| Question Number | Answer   | Additional Guidance  | Mark     |
|-----------------|--|--|----------|
| <b>1(h)(ii)</b> | <ul style="list-style-type: none"> <li>• <b>Q=(R OR B) AND S</b></li> <li>• Alternative correct solutions should be awarded e.g. <ul style="list-style-type: none"> <li>○ (R AND S) OR (B AND S)</li> <li>○ R AND S OR B AND S – works by order of precedence</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• <b>Q=</b> not required</li> <li>• Accept correct transpositions</li> <li>• Order of precedence is (); NOT; AND; OR</li> </ul> | <b>1</b> |

| Question Number    | Answer   | Additional Guidance  | Mark            |
|--------------------|--|--|-----------------|
| <p><b>2(a)</b></p> | <p>Identifying any two (2) of the following (Maximum 2 marks):</p> <ul style="list-style-type: none"> <li>• Database</li> <li>• Bibliographic</li> <li>• Project Management</li> <li>• Presentation</li> <li>• Desktop Publishing</li> <li>• Word Processing</li> <li>• Web Browser</li> <li>• Image Editing</li> <li>• Video Editing</li> <li>• Email</li> <li>• Animation</li> <li>• CAD (not expected)</li> <li>• Programming Environment</li> <li>• Live Chat – Only if example confirms working context</li> <li>• Exclude software whose main purpose is entertainment</li> <li>• Any other appropriate software which could sensibly be used in a general working environment</li> </ul> <p>Any two (2) examples of software use (Maximum 2 marks):</p> <p>Answers may include</p> <ul style="list-style-type: none"> <li>• Image Editing – Cropping images for insertion into a presentation</li> <li>• Live Chat – For getting technical support help from a vendor support site</li> <li>• Web Browser – For looking up the address of a colleague at a</li> </ul> | <p>Do not accept spreadsheet and bee colonies</p> <p>Marks must be awarded 2 x 2 Identifying 4 applications cannot earn 4 marks</p> <p>Do not award brand names (Excel, Google, EndNote, PhotoShop, etc.)</p> <p>Use must follow example software given; if mismatch, then do not award example mark</p> <ul style="list-style-type: none"> <li>• Use must be appropriate for a “general” working environment</li> <li>• Do not award examples indicating entertainment</li> <li>• Use must be main purpose of application. Although word processors can crop</li> </ul> | <p><b>4</b></p> |

|  |  |  |  |
|--|--|--|--|
|  | <p>different university</p> <ul style="list-style-type: none"> <li>• Presentation – Showing results of his research to colleagues at a conference.</li> <li>• Bibliographic – Keeping track of sources for his research.</li> <li>• Video Editing – Creating a video to put on YouTube of his lectures for his students.</li> <li>• CAD - molecular, synthetic, and genetic biology</li> <li>• Programming environment – Creating customised models</li> </ul> | <p>images, the more appropriate software choice would be an image/picture editor.</p> <ul style="list-style-type: none"> <li>• A programming language is not an application; an IDE, editor, or compiler is an application.</li> </ul> |  |
|--|--|--|--|

| Question Number | Answer  | Additional Guidance  | Mark     |
|-----------------|---|--|----------|
| <b>2(b)</b>     | <p>Any 4 from:</p> <ul style="list-style-type: none"> <li>• Software can be redistributed</li> <li>• Source code is available</li> <li>• Source code can be modified</li> <li>• Modified code can be redistributed</li> <li>• A fee can be charged for the software</li> <li>• A fee is not usually charged for the software</li> <li>• Modified code must be made available under the same licence as original code.</li> <li>• Licence may require an acknowledgement of the original author to be included in the code.</li> <li>• Source code can be freely used, changed and shared by anyone subject to conditions specified in the license.</li> </ul> | <ul style="list-style-type: none"> <li>• Accept any other correct feature</li> <li>• Do not award “free” or “no cost” by itself</li> </ul> | <b>4</b> |

| Question Number | Answer  | Additional Guidance  | Mark |
|-----------------|---|--|------|
| 2(c)            | <p>1 or 2 correct = 1 mark<br/> 3 or 4 correct = 2 marks<br/> 5 or 6 correct = 3 marks</p> <p><b>If there are more than 6 arrows, 2 marks Max.</b></p> <div> <pre> graph TD     SS[Secondary Storage] &lt;--&gt; CPU[Central Processing Unit]     M[Mouse] --&gt; CPU     MM[Main Memory] &lt;--&gt; CPU     CPU --&gt; VDU[Visual Display Unit] </pre> </div> <p><b>If unsure, please send it to review</b></p> | <ul style="list-style-type: none"> <li>• Lines without direction cannot be awarded.</li> </ul> | 3    |

| Question Number | Answer  | Additional Guidance  | Mark     |
|-----------------|---|--|----------|
| <b>2(d)</b>     | <p>One mark for name and one mark for use (must match)</p> <ul style="list-style-type: none"> <li>• Control Unit (CU) <ul style="list-style-type: none"> <li>○ Sends signals to other components to coordinate the cycle</li> </ul> </li> <li>• Arithmetic / Logic Unit (ALU) <ul style="list-style-type: none"> <li>○ Performs arithmetic (+,-,/,*, etc.) and logic (AND,NOT, OR, etc.)</li> </ul> </li> <li>• Registers <ul style="list-style-type: none"> <li>○ Very fast storage locations which hold instructions, data, or memory addresses.</li> </ul> </li> <li>• Cache (Not expected) <ul style="list-style-type: none"> <li>○ Sits between components in the microprocessor to make up for the difference in physical speed of the components</li> </ul> </li> <li>• Address Bus <ul style="list-style-type: none"> <li>○ Holds the address of physical memory or the address of an input/output device that is to be read from/written to</li> </ul> </li> <li>• Data Bus <ul style="list-style-type: none"> <li>○ If an instruction needs data, the data is loaded onto the data bus before being read by the CPU</li> <li>○ All data/instructions moved here to go to or from Memory</li> </ul> </li> <li>• Clock <ul style="list-style-type: none"> <li>○ Provides the timing for the cycle</li> </ul> </li> </ul> <p>Other correct uses should be awarded.</p> | <ul style="list-style-type: none"> <li>• "Bus" or "Buses" alone is not awarded; must include qualifier.</li> <li>• Allow "arithmetic" or "logic" unit</li> </ul> | <b>2</b> |

| Question Number | Answer   | Additional Guidance   | Mark     |
|-----------------|--|---|----------|
| 2(e)            | <p>Accept any <b>three</b> from the following. 1 mark each to a max of 3 marks:</p> <ul style="list-style-type: none"> <li>• The computer <b><i>appears to be running</i></b> more than one program/process at a time.</li> <li>• <b>More than one process can be loaded</b> into memory at one time.</li> <li>• Each process has its <b>own memory space</b>/partition.</li> <li>• Each process is given <b>a small amount of time</b> (time slice) to execute in the central processing unit.</li> <li>• Processes are held in a <b>queue/FIFO list</b>.</li> <li>• O/S <b>switches between processes</b></li> <li>• Some processes may have <b>higher priority</b> than others may.</li> <li>• Higher priority processes may be <b>given more time</b> slices/processing time.</li> <li>• Processes can communicate by using shared memory</li> </ul> | <ul style="list-style-type: none"> <li>• Thread is accepted as equivalent to process</li> <li>• Program is accepted as equivalent to process</li> </ul> <p>There is a distinction between the assertion that "two programs <b>are running</b> at the same time" and that "two programs <b>appear to be running</b> at the same time".</p> <p>The first instance is an incorrect statement in the context of this question about a single microprocessor. As such, it cannot be awarded any marks.</p> <p>Ignore reference to multi-core processors.</p> | <b>3</b> |

| Question Number | Answer   | Additional Guidance  | Mark     |
|-----------------|--|--|----------|
| <b>2(f)</b>     | <p>Any two of:</p> <ul style="list-style-type: none"> <li>• Implement formulas which represent the relationships between the given data variables, such as hours of sun and quantity of honey.</li> <li>• Use a programming language to write a customised application to model the colony</li> <li>• Allow user to input initial values for data variables (food, sun)</li> <li>• Use graphical user interface components (boxes, sliders) to adjust input variables will show effects on outputs</li> <li>• Present outputs using graphs showing relationships between food and sun, etc.</li> <li>• Present outputs showing real number of bees and resources (yellow dots are bees; red dots are pollen)</li> <li>• Variables could be changed in real-time with immediate update to the screen (e.g. move a slider, the amount of pollen decreases)</li> </ul> <p>Any other appropriate and correct response incorporating modelling, simulation, or visualisation should be awarded.</p> | <p>The idea here is modelling, simulation, or visualisation of the real world context. Award positively any appropriate responses indicating that software can be used in this manner. Explicit connection to the context is required.</p> | <b>2</b> |

| Question Number | Answer   | Additional Guidance  | Mark     |
|-----------------|--|--|----------|
| <b>3(a)(i)</b>  | <ul style="list-style-type: none"> <li>• Pixel(s)</li> <li>• Pel(s)</li> <li>• Not "picture element" as it is given in the following question</li> </ul> | <ul style="list-style-type: none"> <li>• Do not penalise spelling</li> </ul> | <b>1</b> |

| Question Number | Answer  | Additional Guidance  | Mark     |
|-----------------|---|--|----------|
| <b>3(a)(ii)</b> | <ul style="list-style-type: none"> <li>• Resolution or Pixel Density</li> <li>• Dots per inch, dpi</li> <li>• Pixels per inch, ppi</li> <li>• Dots per centimetre, dpcm</li> <li>• Pixels per centimetre, ppcm</li> </ul> | <ul style="list-style-type: none"> <li>• Do not penalise spelling</li> </ul> | <b>1</b> |

| Question Number  | Answer   | Additional Guidance  | Mark     |
|------------------|--|--|----------|
| <b>3(a)(iii)</b> | <ul style="list-style-type: none"> <li>• Colour depth</li> <li>• Bit depth is awardable</li> </ul> | <ul style="list-style-type: none"> <li>• Do not penalise spelling</li> </ul> | <b>1</b> |

| Question Number                      | Answer   | Additional Guidance                  | Mark     |         |             |   |          |
|--------------------------------------|--|--------------------------------------|----------|---------|-------------|---|----------|
| <b>3(b)</b>                          | One mark for each row<br><table border="1"><thead><tr><th><b>Category of secondary storage</b></th></tr></thead><tbody><tr><td>magnetic</td></tr><tr><td>optical</td></tr><tr><td>solid state</td></tr></tbody></table> | <b>Category of secondary storage</b> | magnetic | optical | solid state | Do not penalise spelling<br>Do not award examples | <b>3</b> |
| <b>Category of secondary storage</b> |  |                                      |          |         |             |   |          |
| magnetic                             |  |                                      |          |         |             |   |          |
| optical                              |  |                                      |          |         |             |   |          |
| solid state                          |  |                                      |          |         |             |   |          |

| Question Number | Answer   | Additional Guidance  | Mark     |
|-----------------|--|--|----------|
| <b>3(c)</b>     | Award 1 mark for each correct answer to a max of 2 marks <ul style="list-style-type: none"> <li>• Any two of the following:               <ul style="list-style-type: none"> <li>○ Timestamp</li> <li>○ Sequence number</li> <li>○ Version</li> <li>○ Protocol type</li> <li>○ Data</li> <li>○ Flags</li> <li>○ Size</li> <li>○ Routing information</li> <li>○ Any other appropriate answer</li> </ul> </li> </ul> | Do not accept source, destination, and check sum, which are provided in the question | <b>2</b> |

| Question Number | Answer  | Additional Guidance | Mark     |
|-----------------|---|---------------------|----------|
| <b>3(d)</b>     | <ul style="list-style-type: none"> <li>• Identifying errors (introduced during transmission)</li> </ul> |                     | <b>1</b> |

| Question Number | Answer   | Additional Guidance  | Mark     |
|-----------------|--|--|----------|
| <b>3(e)</b>     | Divide 4096 by 1024<br>$4096 \div 1024$<br>$4096\text{MB} / (1024 \text{ MB/GB}) = 4 \text{ GB}$ | <ul style="list-style-type: none"> <li>• Ignore attempts to calculate an answer</li> </ul> | <b>1</b> |

| Question Number | Answer  | Additional Guidance   | Mark     |
|-----------------|---|---|----------|
| <b>3(f)</b>     | <ul style="list-style-type: none"> <li>• Internet (Any 1 of the following):               <ul style="list-style-type: none"> <li>○ Interconnected networks of networks/machines/<b>hardware</b></li> <li>○ Geographically distributed networks/machines/hardware</li> <li>○ Uses protocols for communication</li> </ul> </li> <li>• World Wide Web (Any 1 of the following)               <ul style="list-style-type: none"> <li>○ The <b>information</b> stored on the hardware</li> <li>○ Pages of information stored on servers (pages written in HTML)</li> <li>○ Uses HTTP / HTTPS to send/receive pages between servers and clients</li> </ul> </li> </ul> <p>Accept any other correct comparison</p> | <ul style="list-style-type: none"> <li>• Only one topic addressed earns 1 mark max</li> </ul> | <b>2</b> |

| Question Number | Answer  | Additional Guidance | Mark     |
|-----------------|---|---------------------|----------|
| <b>3(g)(i)</b>  | <ul style="list-style-type: none"> <li>• Line numbers 5 – 10</li> </ul> | Accept lines 4 - 11 | <b>1</b> |

| Question Number | Answer  | Additional Guidance  | Mark     |
|-----------------|---|--|----------|
| <b>3(g)(ii)</b> | <ul style="list-style-type: none"> <li>• Any one of the following: <ul style="list-style-type: none"> <li>○ The &lt;li&gt;&lt;/li&gt; tags refer back to line number 10/the "li" style</li> <li>○ The &lt;a&gt;&lt;/a&gt; tags refer back to line number 6/the "a" style</li> <li>○ The tags &lt;li&gt; and &lt;a&gt; refer back to the information in the CSS</li> </ul> </li> </ul> | <p>Allow: &lt;a:hover&gt; equivalent to &lt;a&gt;</p> <p>Allow: Missing &lt;/&gt; tag in any description</p> | <b>1</b> |

| Question Number | Answer    | Additional Guidance | Mark     |
|-----------------|-----------|---------------------|----------|
| <b>3(h)(i)</b>  | Amplitude |                     | <b>1</b> |

| Question Number | Answer  | Additional Guidance   | Mark     |
|-----------------|---|---|----------|
| <b>3(h)(ii)</b> | <p>Any one of the following – 1 mark</p> <ul style="list-style-type: none"> <li>• (The more samples,) the smoother the digital representation of the original audio.</li> <li>• (Higher sampling rates) result in less distortion of the original audio</li> <li>• This makes the resulting digital representation more accurately match the original audio.</li> </ul> | <ul style="list-style-type: none"> <li>• Do not award “better”, “better quality”, or similar</li> </ul> | <b>1</b> |

| Question Number | Answer   | Additional Guidance | Mark     |
|-----------------|--|---------------------|----------|
| <b>3(i)</b>     | <p>Must have idea of <b>runs</b> (1) being compressed to <b>a single item + a count</b> of that item (1)</p> <p>Example:</p> <p>Simple mono-chrome icon will have long sequences of bits of same colour (1)</p> <p>Sequences/runs of identical data are translated/stored as a single data value and a count (1)</p> |                     | <b>2</b> |

| Question Number | Answer   | Additional Guidance  | Mark     |
|-----------------|--|--|----------|
| 4(a)            | <p>Any three of the following impacts:</p> <ul style="list-style-type: none"> <li>• Pollution (water, air, noise) resulting from the manufacturing process</li> <li>• High energy and water volumes needed for the manufacturing process</li> <li>• Mineral mining contaminates ground water</li> <li>• Mineral (copper, gold, silver, lithium) resource depletion</li> <li>• High energy use to keep machines cool with air conditioning or fans</li> <li>• Contain toxic components which means computing devices are hazardous waste</li> <li>• Batteries (laptop, lithium cells) disposal is hazardous and needs specialised disposal facilities</li> <li>• Computing devices sent to landfills contaminate ground and water resources</li> <li>• Any other appropriate responses as long as they're distinct from each other</li> </ul> <p>Any one of the following actions:</p> <ul style="list-style-type: none"> <li>• Check national and local legislation</li> <li>• Some countries/states/regions require sellers to recycle own waste</li> <li>• Research recycling facilities to see if e-waste is acceptable</li> <li>• Find if local/national/regional government agencies charge for collection and disposal of e-waste</li> <li>• Find sellers offering exchange old for new + cost purchase options</li> <li>• Find charities (local, regional) which take donations of old devices</li> <li>• Turn off machines when not in use to save energy.</li> <li>• Any other appropriate response as long as it is interpretable to match an impact.</li> </ul> | <ul style="list-style-type: none"> <li>• 3 marks maximum for environmental impacts</li> <li>• 1 mark maximum for suggestion to reduce environmental impact</li> <li>• Suggestion does not have to follow impact.</li> <li>• Example: Mining of minerals pollutes the water and depletes valuable mineral stocks. Ground water is contaminated by sending batteries to landfill sites. Energy can be saved by turning the machines off at night. (4 marks)</li> </ul> | <b>4</b> |

| Question Number | Answer  | Additional Guidance   | Mark     |
|-----------------|---|---|----------|
| <b>4(b)</b>     | <p>Any two of the following</p> <p>Easier / faster to:</p> <ul style="list-style-type: none"> <li>○ Sort</li> <li>○ Search (by using queries)</li> <li>○ Produce reports</li> <li>○ Analyse data</li> <li>○ Keep organised</li> </ul> | <p>Do not accept:</p> <ul style="list-style-type: none"> <li>• Primary or foreign keys</li> <li>• Relationships</li> <li>• Tables</li> <li>• Relational Database</li> </ul> | <b>2</b> |

| Question Number | Answer  | Additional Guidance           | Mark     |
|-----------------|---|-------------------------------|----------|
| <b>4(c)(i)</b>  | <ul style="list-style-type: none"> <li>• Primary Key</li> </ul> <p><b>Ignore additional information in the answer</b></p> | Do not accept 'Key' by itself | <b>1</b> |

| Question Number | Answer  | Additional Guidance           | Mark     |
|-----------------|---|-------------------------------|----------|
| <b>4(c)(ii)</b> | <ul style="list-style-type: none"> <li>• Foreign Key</li> </ul> <p><b>Ignore additional information in the answer</b></p> | Do not accept 'Key' by itself | <b>1</b> |

| Question Number  | Answer   | Additional Guidance | Mark     |
|------------------|--|---------------------|----------|
| <b>4(c)(iii)</b> | <ul style="list-style-type: none"> <li>• Any one of the following: <ul style="list-style-type: none"> <li>○ To form a relationship between the tables</li> <li>○ To make connections between the tables</li> <li>○ To facilitate the use of queries across tables</li> <li>○ To relate the records in one table to records in another</li> </ul> </li> </ul> |                     | <b>1</b> |

| Question Number | Answer   | Additional Guidance   | Mark     |
|-----------------|--|---|----------|
| <b>4(d)</b>     | <p>One mark for <b>UPDATE</b> with correct table name<br/> One mark for <b>SET</b> with correct field name and new value<br/> One mark for <b>WHERE</b> with primary key and value</p> <p>Example:</p> <ul style="list-style-type: none"> <li>• UPDATE tblOutlet<br/> SET (Outlet_Address = "360 Pinnacle Place")<br/> WHERE Outlet_ID=2;</li> </ul> | <p>Do not penalise spelling of field names or table prefixes<br/> Do not penalise capitalisation of key words<br/> Do not penalise minutiae of syntax such as brackets, semi-colons, quotes</p> | <b>3</b> |

| Question Number | Answer  | Additional Guidance   | Mark     |
|-----------------|---|---|----------|
| <b>4(e)</b>     | <p>Justification expected in context of the question:</p> <ul style="list-style-type: none"> <li>○ Can represent a larger number of characters</li> <li>○ 16-bit representation is larger than 8-bit representation</li> </ul> <p>Example (in context of question)</p> <ul style="list-style-type: none"> <li>○ Foreign language characters (ö, ú, ê, ç)</li> <li>○ Foreign language characters used as alphabet</li> </ul> | <p>Not applicable to context of question (do not award)</p> <p>Smiley (WingDings, DingBats...)</p> <p>Mathematical symbols</p> <p>Copyright and trademark</p> <p>Foreign currency symbols</p> <p>Any other symbols supported by Unicode</p> | <b>1</b> |

| Question Number | Answer  | Additional Guidance                               | Mark     |
|-----------------|---|---|----------|
| <b>4(f)</b>     | <p>Any one of:</p> <ul style="list-style-type: none"> <li>• 0 - 255</li> <li>• 255 - 0</li> </ul> | <p>Do not award 256.</p> <p>Do not award 255.</p> | <b>1</b> |

| Question Number | Answer   | Additional Guidance   | Mark     |
|-----------------|--|---|----------|
| <b>4(g)</b>     | <p>Any three of the following:</p> <ul style="list-style-type: none"> <li>○ Server can embed scripts into HTML page</li> <li>○ Script is executed on the server</li> <li>○ Result of execution is sent back to the client as an HTML page</li> <li>○ All processing takes place on the server, not on the client</li> <li>○ No software plugins to install on client machines</li> <li>○ Software updates and patches only performed on server</li> <li>○ Faster than client-side scripting</li> <li>○ More secure than client-side scripting</li> </ul> | <ul style="list-style-type: none"> <li>○ Do not credit 'Script may interact with a database'</li> </ul> | <b>3</b> |

| Question Number    | Answer  | Additional Guidance   | Mark            |
|--------------------|---|---|-----------------|
| <p><b>5(a)</b></p> | <p>Compiler – Any of the following:</p> <ul style="list-style-type: none"> <li>• Translates all the source code as a single block</li> <li>• Object code is produced which can be linked to other modules</li> <li>• Compilers can perform optimisation on object code</li> <li>• Generated executable does not need compiler to execute</li> <li>• Executable can be moved between machines independent of compiler</li> <li>• Executable file runs more quickly than an interpreter with source code</li> <li>• Needs to be recompiled with each code change therefore development is slower.</li> </ul> <p>Interpreter – Any of the following:</p> <ul style="list-style-type: none"> <li>• Code is translated one line at a time and immediately executed</li> <li>• Code needs the interpreter to be run</li> <li>• Code cannot be moved between machines, unless the interpreter is moved as well</li> <li>• Debugging could be easier as interpreter <b>immediately</b> identifies line with error</li> <li>• Readable source code may need to be given to people who use the program</li> <li>• Runs less quickly than an executable file</li> <li>• Very good for creating prototypes due to quick development environments</li> </ul> <p>Quality of Written Communication</p> | <ul style="list-style-type: none"> <li>• A bulleted list of advantages or disadvantages is only worth 2 marks max.</li> </ul> | <p><b>6</b></p> |

- 1-2: Some basic points from **at least one** of the categories; No recommendation or recommendation is not justified; Spelling, grammar, and punctuation **errors hinder meaning**.
- 3-4: At least one relevant point **from each category**; Includes recommendation with minimal justification. Spelling, grammar, and punctuation **errors occur**, but do not hinder meaning.
- 5-6: Relevant points from **both categories**; Includes well-justified recommendation. Spelling, grammar, and punctuation are **used accurately** and meaning is clear.

**Example:**

A compiler translates all the code at one time. The program can be run on any machine. (One category only; no recommendation; QWC ok; 2 marks max)

**Example:**

A compiler can perform optimisation on the code to make it more efficient. An interpreter can't because it executes one line at a time. A compiler makes a program that can be run on any machine. A compiler would be better for the pupil. (Two categories; unjustified recommendation; QWC ok; 4 marks max)

**Example:**

A compiler translates source code in a whole block to make an executable file. The executable file can run on any machines with the target operating system. It does not need the compiler to run. An interpreter translates each line of source code one at a time and executes it. To run the program on another machine, you need the interpreter and the source code. I recommend a compiler for the pupil because it makes

giving the program to another person easier, as they don't need the interpreter. (Two categories; justified recommendation; QWC ok; 6 marks max)

**Example:**

I recommend an interpreter because:

- Translates one line at a time
- Easier to see errors
- Good for quick development

I don't recommend a compiler because:

- It's slow
- Have to give away interpreter as well as code

(Two categories; justified recommendation; QWC unmarkable; 2 marks max)

| Question Number | Answer  | Additional Guidance | Mark     |
|-----------------|---|---------------------|----------|
| <b>5(b)(i)</b>  | <ul style="list-style-type: none"><li>(Line number) 3</li></ul> |                     | <b>1</b> |

| Question Number | Answer                      | Additional Guidance | Mark     |
|-----------------|-----------------------------|---------------------|----------|
| <b>5(b)(ii)</b> | 9-16, both must be provided |                     | <b>1</b> |

| Question Number | Answer  | Additional Guidance | Mark       |           |            |   |           |              |          |  |           |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |  |  |  |          |
|-----------------|---|---------------------|------------|-----------|------------|---|-----------|--------------|----------|--|-----------|--|--|--|----|--|--|--|---|--|--|--|--|--|----|--|--|--|---|--|--|--|--|--|----|--|--|--|---|--|--|--|--|--|----|--|--|--|---|--|--|--|--|--|----|--|--|--|---|--|--|--|--|--|--|--|--|----------|
| <b>5(c)</b>     | <ul style="list-style-type: none"> <li>• 1 mark = 0-5 sequence under column i</li> <li>• 1 mark = 78, 83, 72, 80, 83 sequence under column anArray[i]</li> </ul> <table border="1"> <thead> <tr> <th>b</th> <th>f</th> <th>i</th> <th>anArray[i]</th> <th>c</th> </tr> </thead> <tbody> <tr> <td><b>75</b></td> <td><b>FALSE</b></td> <td><b>0</b></td> <td></td> <td><b>-1</b></td> </tr> <tr> <td></td> <td></td> <td></td> <td>78</td> <td></td> </tr> <tr> <td></td> <td></td> <td>1</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td>83</td> <td></td> </tr> <tr> <td></td> <td></td> <td>2</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td>72</td> <td></td> </tr> <tr> <td></td> <td></td> <td>3</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td>80</td> <td></td> </tr> <tr> <td></td> <td></td> <td>4</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td>83</td> <td></td> </tr> <tr> <td></td> <td></td> <td>5</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> | b                   | f          | i         | anArray[i] | c | <b>75</b> | <b>FALSE</b> | <b>0</b> |  | <b>-1</b> |  |  |  | 78 |  |  |  | 1 |  |  |  |  |  | 83 |  |  |  | 2 |  |  |  |  |  | 72 |  |  |  | 3 |  |  |  |  |  | 80 |  |  |  | 4 |  |  |  |  |  | 83 |  |  |  | 5 |  |  |  |  |  |  |  |  | <b>2</b> |
| b               | f   | i                   | anArray[i] | c         |            |   |           |              |          |  |           |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |  |  |  |          |
| <b>75</b>       | <b>FALSE</b>  | <b>0</b>            |            | <b>-1</b> |            |   |           |              |          |  |           |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |  |  |  |          |
|                 |   |                     | 78         |           |            |   |           |              |          |  |           |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |  |  |  |          |
|                 |   | 1                   |            |           |            |   |           |              |          |  |           |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |  |  |  |          |
|                 |   |                     | 83         |           |            |   |           |              |          |  |           |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |  |  |  |          |
|                 |   | 2                   |            |           |            |   |           |              |          |  |           |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |  |  |  |          |
|                 |   |                     | 72         |           |            |   |           |              |          |  |           |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |  |  |  |          |
|                 |   | 3                   |            |           |            |   |           |              |          |  |           |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |  |  |  |          |
|                 |   |                     | 80         |           |            |   |           |              |          |  |           |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |  |  |  |          |
|                 |   | 4                   |            |           |            |   |           |              |          |  |           |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |  |  |  |          |
|                 |   |                     | 83         |           |            |   |           |              |          |  |           |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |  |  |  |          |
|                 |   | 5                   |            |           |            |   |           |              |          |  |           |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |  |  |  |          |
|                 |   |                     |            |           |            |   |           |              |          |  |           |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |    |  |  |  |   |  |  |  |  |  |  |  |  |          |

| Question Number | Answer  | Additional Guidance  | Mark     |
|-----------------|---|--|----------|
| 5(d)            | <ul style="list-style-type: none"> <li>• Examples: <ul style="list-style-type: none"> <li>○ WHILE ((NOT f) AND (i &lt; LENGTH (anArray))) DO</li> <li>○ WHILE (NOT f) AND (i &lt; 5) DO</li> <li>○ WHILE (f = FALSE) AND (i &lt; 5) DO</li> <li>○ WHILE (NOT f) AND i &lt; 5 DO</li> <li>○ WHILE NOT f AND i &lt; 5 DO</li> <li>○ WHILE (i &lt; LENGTH (anArray)) DO</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• Any sensible pseudocode is awardable</li> <li>• Brackets not required</li> <li>• Accept &lt;= in place of &lt;</li> </ul> | <b>1</b> |

| Question Number | Answer   | Additional Guidance  | Mark     |
|-----------------|--|--|----------|
| 5(e)            | <p>Any one of:</p> <ul style="list-style-type: none"> <li>• Finding the <b>location</b> of a target number in an array</li> <li>• Finding the <b>position</b> of a number in an array</li> </ul> | <ul style="list-style-type: none"> <li>• “Finding a number in an array” is not awardable.</li> <li>• The idea of location is important because of the <b>return</b> statement value</li> </ul> | <b>1</b> |

| Question Number | Answer   | Mark   |
|-----------------|--|--|
| 5(f)            | <ul style="list-style-type: none"> <li>• Flowcharts are not awarded, stated in question</li> <li>• Do not penalise pseudocode or programming language syntax errors, as long as logic is discernible</li> <li>• Many alternative solutions are possible and should be awarded <ul style="list-style-type: none"> <li>○ Reading all measurements into an array and then processing, if correct, should be awarded</li> <li>○ STEP on FOR loop not required for mark</li> <li>○ Comments not required</li> </ul> </li> <li>• For full marks, solution must be correct and work</li> </ul> <pre> 1 2 // Initialisation of variables 3 SET totalWeight TO 0 4 5 // Print prompt and get count of weights 6 SEND "How many weights do you want to enter?" TO DISPLAY 7 RECEIVE numWeights FROM (INTEGER) KEYBOARD 8 9 // Loop for count as entered 10 FOR i FROM 1 TO numWeights STEP 1 DO 11     SEND "Enter a weight:" TO DISPLAY 12     RECEIVE aFruit FROM (INTEGER) KEYBOARD 13 14     // Add up as each weight is entered 15     SET totalWeight TO totalWeight + aFruit 16 END FOR 17 18 // Find average and print out 19 SET averageWeight = (REAL) totalWeight / numWeights 20 SEND "Average weight is: %2d" + averageWeight TO DISPLAY 21 22 </pre> | <div style="border: 1px solid black; padding: 5px;"> <p>Initialise variables sensibly = 1 mark (1.1.2)<br/>totalWeight must be set before first use, if used in calculation.</p> <p>Retrieving count from keyboard = 1 mark (2.4.1)</p> <p>Any loop control for multiple weights with correct bounds = 1 mark (2.2.2)</p> <p>Adding up total inside loop = 1 mark (1.1.2)</p> <p>Calculating average = 1 mark (1.1.8)<br/>Output average = 1 mark (1.1.2)</p> <p>Attempt to deal with INTEGER/REAL/STRING conversion = 1 mark, even if not correct (1.1.2)</p> </div> |

## Content Mapping Grid

| Question | Specification | Marks |
|----------|---------------|-------|
| 1a       | 4.1.3, 4.2.5  | 3     |
| 1b       | 3.1.1         | 2     |
| 1c(i)    | 4.2.3         | 1     |
| 1c(ii)   | 4.2.3         | 1     |
| 1c(iii)  | 2.2.2         | 1     |
| 1d       | 3.1.2         | 1     |
| 1e       | 3.1.2         | 1     |
| 1f(i)    | 3.1.4         | 1     |
| 1f(ii)   | 3.1.4         | 1     |
| 1f(iii)  | 3.1.4         | 1     |
| 1g       | 4.3.1         | 1     |
| 1h(i)    | 4.3.1         | 3     |
| 1h(ii)   | 4.3.2         | 1     |
| 2a       | 4.4.2         | 4     |
| 2b       | 6.1.4         | 4     |
| 2c       | 4.2.1         | 3     |
| 2d       | 4.2.2         | 2     |
| 2e       | 4.4.1         | 3     |
| 2f       | 4.4.3         | 2     |

| Question | Specification | Marks |
|----------|---------------|-------|
| 3a(i)    | 3.2.2         | 1     |
| 3a(ii)   | 3.2.2         | 1     |
| 3a(iii)  | 3.2.2         | 1     |
| 3b       | 4.2.4         | 3     |
| 3c       | 5.1.6         | 2     |
| 3d       | 5.1.7         | 1     |
| 3e       | 3.3.1         | 1     |
| 3f       | 5.2.1, 5.2.2  | 2     |
| 3g(i)    | 5.2.3         | 1     |
| 3g(ii)   | 5.2.3         | 1     |
| 3h(i)    | 3.2.3         | 1     |
| 3h(ii)   | 3.2.3         | 1     |
| 3j       | 3.3.3         | 2     |

| Question | Specification                 | Marks |
|----------|-------------------------------|-------|
| 4a       | 6.1.2                         | 4     |
| 4b       | 3.5.1                         | 2     |
| 4c(i)    | 3.5.2                         | 1     |
| 4c(ii)   | 3.5.2                         | 1     |
| 4c(iii)  | 3.5.2                         | 1     |
| 4d       | 3.5.3                         | 3     |
| 4e       | 3.2.1                         | 1     |
| 4f       | 3.2.4                         | 1     |
| 4g       | 5.2.4                         | 3     |
| 5a       | 4.5.2                         | 6     |
| 5b(i)    | 2.2.1                         | 1     |
| 5b(ii)   | 2.2.1                         | 1     |
| 5c       | 2.1.6                         | 2     |
| 5d       | 1.1.5                         | 1     |
| 5e       | 1.1.3                         | 1     |
| 5f       | 1.1.2, 2.4.1,<br>2.2.2, 1.1.8 | 7     |



