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Cambridge Assessment International Education

# Cambridge International AS & A Level

**INFORMATION TECHNOLOGY** **9626/04**

Paper 4 Advanced Practical **February/March 2022**

MARK SCHEME

Maximum Mark: 90

**Published**

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the February/March 2022 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.



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**[Turn over**

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## Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently, e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5:

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

GENERIC MARKING PRINCIPLE 6:

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

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| Question | Answer | Marks |
|---|---|---|
| See task 1 below for examples of graphics. | | |
| Task 1 | There is a square border with rounded corners and a narrower outline than the ellipse | **1** |
| | The ellipse has an even red border and a yellow fill | **1** |
| | The ellipse and text are correctly aligned to the square – there are small gaps top/bottom | **1** |
| | The ellipse is in the correct position and proportion with the square – *occupies most of left half* | **1** |
| | The Heron image is cut-out cleanly – *including the legs* | **1** |
| | … the definition and colours are preserved – *including neck feathers and eye* | **1** |
| | The Heron is in the correct proportion with the ellipse | **1** |
| | The foliage size and placement are correct with no gaps | **1** |
| | The curved Heron text is added in the correct place and is the correct size | **1** |
| | … All text sits inside the ellipse curve evenly | **1** |
| | … The text is evenly spaced – *aligned to the centre of the curve* | **1** |
| | The text has a black outline | **1** |
| | The black outline width is suitable – *the font colour can be seen* | **1** |
| | The text gradient fill is white – red | **1** |
| | The Villa Holidays text is correctly placed and aligned | **1** |
| | The Villa Holidays text has a black outline and a white – red gradient fill | **1** |
| | The image is saved as an svg file and fully displays in a browser | **1** |
| | The image is saved as an svg file and is exactly 10 cm square | **1** |
| | The image is saved as a bitmap – .png file with transparent white space | **1** |
| | The bitmap image size is 200px × 200px | **1** |
| | **Available marks** | **20** |

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| Question | Answer | Marks |
|---|---|---|
| See task 2 below for examples of scroll unrolling | | |
| Task 2 | The stage is set as 550 × 400 – *Must animate* | **1** |
| | The cylinder body is created correctly and is complete | **1** |
| | The cylinder has a smooth oval top and matching curved bottom throughout the animation | **1** |
| | The cylinder is all yellow with a contiguous outline | **1** |
| | The flap is the correct size with a thin outline and matches cylinder height at the top and the bottom | **1** |
| | The roll is always all Yellow with all outlines – *must unroll* | **1** |
| | The cylinder unrolls from left to right, the flap is contiguous, and the proportions match the images shown in the question paper | **1** |
| | The unrolling takes 3 seconds – *with static unrolled area* | **1** |
| | The unrolling movement is smooth – *cylinder/roll must narrow* | **1** |
| | The roll narrows smoothly | **1** |
| | The top and bottom of the roll remain intact and match the movement – *must narrow* | **1** |
| | The letter H completely displays – incrementally | **1** |
| | The letter E completely displays – incrementally | **1** |
| | The letter R completely displays – incrementally | **1** |
| | The letter O completely displays – incrementally | **1** |
| | The letter N completely displays – incrementally | **1** |
| | The letters are static throughout | **1** |
| | … The letters are evenly spaced | **1** |
| | … The letters are correctly placed, aligned, remain static and are sized to match the images shown in the question paper | **1** |
| | The letters are the correct colour, font and case | **1** |
| | The ‘Villa Holidays’ text is correct – *including the case* | **1** |
| | The ‘Villa Holidays’ text appears at the correct time and remains to be read | **1** |
| | … The ‘Villa Holidays’ text is correctly placed and aligned | **1** |
| | ... The ‘Villa Holidays’ text is the same font as the letters | **1** |

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| Question | Answer | Marks |
|---|---|---|
| Task 2 (cont) | … The 'Villa Holidays' text is the correct font, size and colour | 1 |
| | The animation matches the proportions of the images shown in the question paper when completely unrolled | 1 |
| | The animation loops continually | 1 |
| | The animation loops after 2 seconds | 1 |
| | The animation loops seamlessly | 1 |
| | The animation is saved as an animated gif | 1 |
| | **Available marks** | 30 |

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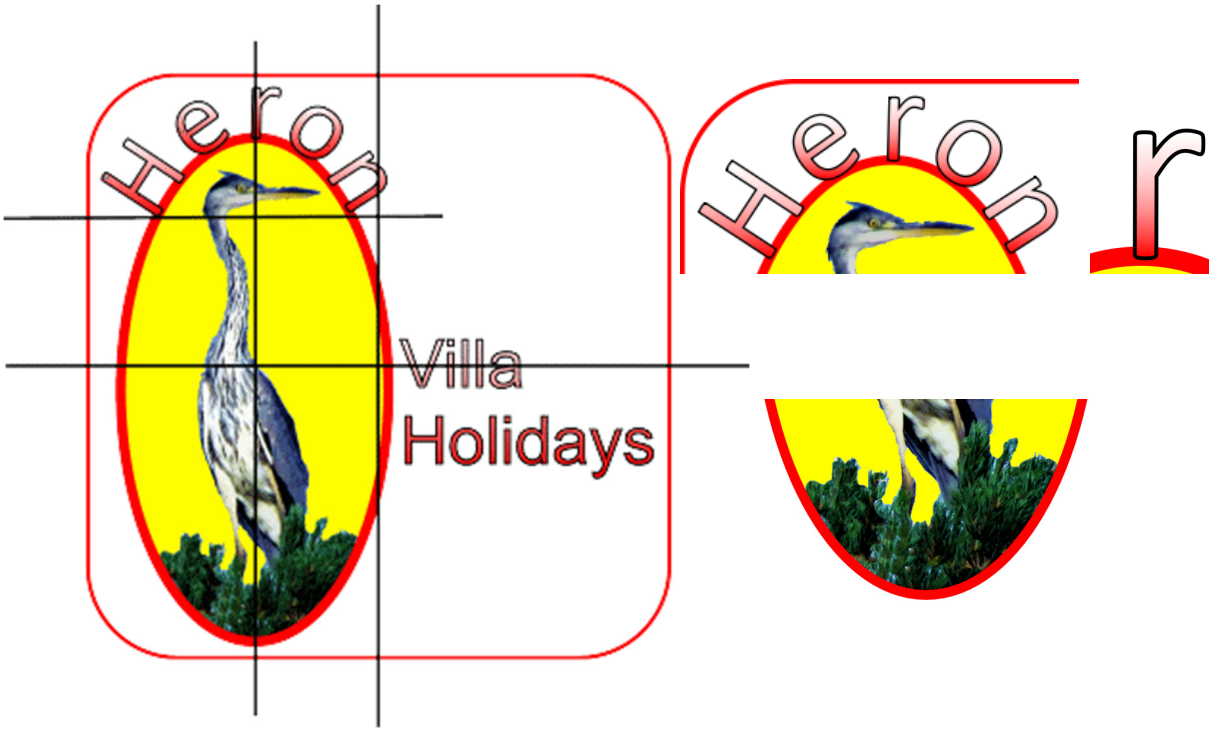
| Question | Answer | Marks |
|---|---|---|
| See task 3 below for screenshots of spreadsheet and formulae | | |
| 3(a) | All text is displayed in the case shown in the question paper | **1** |
| | All the text is displayed in the colours shown in the question paper | **1** |
| | All the text is wrapped as shown in the question paper | **1** |
| 3(b) | RandBetween(1,3) used to generate values for the 'gift' box – *Column A* | **1** |
| | RandBetween(1,3) used to generate values for the 'chosen' box – *Column B* | **1** |
| | Valid formulae are used for the 'KEEP' column<br>*e.g. IF(B6=A6,"WIN","LOSE")* | **1** |
| | Valid formulae are used for the 'SWAP' column<br>*e.g. IF(B6=A6,"LOSE","WIN")* | **1** |
| | **…** The correct results are displayed for the 'KEEP' and 'SWAP' columns | **1** |
| | **…** All the numbers and the 'WIN,' 'LOSE' results are consistent | **1** |
| | There are 1500 simulations – *Rows 6–1505 in spreadsheet* | **1** |
| 3(c) | Cells F6:F20 display increments of 100 to 1500 using a replicable formula | **1** |
| | Cells G6:H20 display KEEP + SWAP values equal to column F for all rows | **1** |
| | A replicable formula is used for the KEEP + SWAP totals | **1** |
| | Valid formulae are used to display the correct percentages in cells I6:I20 | **1** |
| | Totals for G3 + H3 (*KEEP + SWAP)* = 1500 | **1** |
| | All merged cells and rows are correct and match the image shown in the question paper | **1** |
| | All the cell borders are correct and consistent | **1** |
| | All the text matches the text shown in the question paper | **1** |
| 3(d) | Valid formulae are used to display the final totals e.g.<br>*COUNTIF(C6:C1505,"WIN") COUNTIF(C6:C1505,"LOSE")* | **1** |
| | All the data refreshes consistently | **1** |
| | **Available marks** | **20** |

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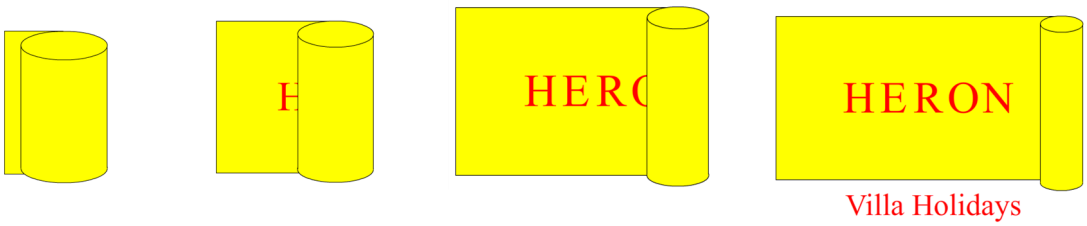
| Question | Answer | Marks |
|---|---|---|
| See task 4 below for JavaScript code solution | | |
| Task 4 | The JavaScript code is entirely within the <script> tags | **1** |
| | A function named check() used to match the <*button onclick…* parameter shown in the HTML | **1** |
| | The *guess <input id…* referred to in code is referenced for comparison | **1** |
| | The .value property is used correctly with the *guess <input id ..* value | **1** |
| | *check() and guess* references are always lower case | **1** |
| | alert("Well done") is used correctly in the JavaScript code | **1** |
| | alert("Sorry that's wrong) is used correctly in the JavaScript code | **1** |
| | A valid conditional test is used in the JavaScript code *e.g. if () else()* | **1** |
| | The "==" comparison operator is used in the JavaScript code | **1** |
| | A variable for a for a counter is declared in the JavaScript code | **1** |
| | The '++' increment operator is used in the JavaScript code | **1** |
| | alert("Try again") is used correctly in the JavaScript code | **1** |
| | alert("Well done. You took "+*tries*+" tries") is used correctly in the JavaScript code | **1** |
| | The document.getElementById method is used to display an element | **1** |
| | The document.getElementById method is used to display the element at the 'Result' bookmark - *e.g. document.getElementById("Result")* | **1** |
| | The '.innerHTML' element is used to display the text on the page *e.g. document.getElementById("Result").innerHTML* | **1** |
| | TEST 1 – Sorry that's wrong displayed in alert box | **1** |
| | TEST 2 – Try again displayed in alert box | **1** |
| | TEST 3 – Try again displayed on the page | **1** |
| | Test 4 – Well done. You took *n* tries correctly displayed on the page | **1** |
| | Available marks | **20** |

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**Task 1**




**Task 2**



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**Task 3**

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 2 | **Probability Simulation** | | | | Totals | Number of simulations | **KEEP** chosen box Wins | **SWAP** to other box Wins | %age of Wins if Swapped |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | Box with gift (1,2 or 3) | Box chosen (1,2 or 3) | **KEEP** chosen box | **SWAP** to other box | | No of simulations | **KEEP** chosen box Wins | **SWAP** to other box Wins | %age of Wins if Swapped |
| 6 | | | | | | 100 | | | |

| 5 | Box with gift (1,2 or 3) | Box chosen (1,2 or 3) | **KEEP** chosen box | **SWAP** to other box |
|---|---|---|---|---|
| 6 | =RANDBETWEEN(1,3) | =RANDBETWEEN(1,3) | =IF(A6=B6,"WIN","LOSE") | =IF(A6<>B6,"WIN","LOSE") |
| 7 | =RANDBETWEEN(1,3) | =RANDBETWEEN(1,3) | =IF(A7=B7,"WIN","LOSE") | =IF(A7<>B7,"WIN","LOSE") |
| 8 | =RANDBETWEEN(1,3) | =RANDBETWEEN(1,3) | =IF(A8=B8,"WIN","LOSE") | =IF(A8<>B8,"WIN","LOSE") |
| 9 | =RANDBETWEEN(1,3) | =RANDBETWEEN(1,3) | =IF(A9=B9,"WIN","LOSE") | =IF(A9<>B9,"WIN","LOSE") |

| 5 | Box with gift (1,2 or 3) | Box chosen (1,2 or 3) | **KEEP** chosen box | **SWAP** to other box |
|---|---|---|---|---|
| 6 | 1 | 2 | LOSE | WIN |
| 7 | 3 | 3 | WIN | LOSE |
| 8 | 1 | 1 | WIN | LOSE |
| 9 | 2 | 2 | WIN | LOSE |
| 1502 | 1 | 1 | WIN | LOSE |
| 1503 | 1 | 3 | LOSE | WIN |
| 1504 | 1 | 2 | LOSE | WIN |
| 1505 | 2 | 2 | WIN | LOSE |

| No of simulations | **KEEP** chosen box Wins | **SWAP** to other box Wins | %age of Wins if Swapped |
|---|---|---|---|
| 100 | =COUNTIF($C$6:INDIRECT("C"&F6+5),"WIN") | =COUNTIF($D$6:INDIRECT("D"&F6+5),"WIN") | =H6/(G6+H6) |
| =F6+100 | =COUNTIF($C$6:INDIRECT("C"&F7+5),"WIN") | =COUNTIF($D$6:INDIRECT("D"&F7+5),"WIN") | =H7/(G7+H7) |
| =F7+100 | =COUNTIF($C$6:INDIRECT("C"&F8+5),"WIN") | =COUNTIF($D$6:INDIRECT("D"&F8+5),"WIN") | =H8/(G8+H8) |
| =F8+100 | =COUNTIF($C$6:INDIRECT("C"&F9+5),"WIN") | =COUNTIF($D$6:INDIRECT("D"&F9+5),"WIN") | =H9/(G9+H9) |

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| E | F | G | H | I |
|---|---|---|---|---|
| Totals | Number of simulations | KEEP chosen box Wins | SWAP to other box Wins | %age of Wins if Swapped |
| | 1500 | 490 | 1010 | 67% |

| | F | G | H | I |
|---|---|---|---|---|
| Totals | Number of simulations | KEEP chosen box Wins | SWAP to other box Wins | %age of Wins if Swapped |
| | =G3+H3 | =COUNTIF(C:C,"WIN") | =COUNTIF(C:C,"lose") | =H3/(G3+H3) |

**Task 4**

```
<body>
<h1>Guess my number</h1>
<h2>Please enter your guess for a number between 1 and 10 (inclusive)</h2>
<h2>Your guess:        <input id="guess"></h2>
<div align=center>
<button onclick="check()">Submit guess</button><h1 id="Result"></h1>
</div>
<script>
var RandomNumber = Math.floor(Math.random() * 10) + 1;
//This statement generates a random number between 1 and 10 (inclusive) for the RandomNumber
variable
var tries=1;
var text
function check()
{
  if (RandomNumber == guess.value)
     {text= "Well done. You took "+tries+ " tries";
     document.getElementById("Result").innerHTML=text; }
 else
   { text= "Try again";  document.getElementById("Result").innerHTML=text; tries++;}

}
</script>
</body>
```