



## Cambridge International AS & A Level

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THINKING SKILLS

9694/12

Paper 1 Problem Solving

October/November 2020

MARK SCHEME

Maximum Mark: 50

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**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 October/November 2020 series for most Cambridge IGCSE™, Cambridge International A and AS Level and Cambridge Pre-U components, and some Cambridge O Level components.

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This document consists of **8** printed pages.

**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.

**NOTES FOR MARKERS****Working**

Where a final answer is underlined in the mark scheme, full marks are awarded for a correct answer, regardless of whether there is any supporting working, unless an exception is noted in the mark scheme.

For partial credit, the evidence needed to award the mark will usually be shown on its own line in the mark scheme, or else will be defined in italic text.

For explanations and verbal justifications, apply the principle of ‘words to that effect’.

**No response**

If there is any attempt at a solution award 0 marks not NR. “–” or “?” constitute no attempt at a solution.

**Abbreviations**

The following abbreviations may be used in a mark scheme:

<b>AG</b>	answer given (on question paper)
<b>awrt</b>	answer which rounds to
<b>ft</b>	follow through (from earlier error)
<b>oe</b>	or equivalent
<b>SC</b>	special case
<b>soi</b>	seen or implied











**Annotations**

Where the answer is underlined in the mark scheme, and a candidate's correct final answer is both clear and clearly identified (encircled, underlined etc.), it is not necessary to annotate that item; nor is it necessary to annotate when there is No Response.

Where there is a response that scores 0, either SEEN should be used, or some other annotation(s) to indicate why no marks can be awarded (Caret, TE, NGE, Cross).

Partial credit should be indicated with a 1 (or, occasionally, a 2) at the point at which that mark has been earned.

The highlighter should be used anywhere that this helps to identify the precise piece of the working to which another stamp pertains (or an inexplicit correct answer).

	Correct item
	Incorrect item
	Individual mark of partial credit
	Double mark of partial credit
	Essential element of answer/working missing
	Correct follow through
	Transcription error
	Judged to be not good enough to earn the relevant credit
	Benefit of doubt
	Working seen but no credit awarded; blank page checked
<b>Highlight</b>	Identifies the part of the working to which another stamp pertains

Question	Answer	Marks
1	'Congratulations' has 2 more letters than 'Happy Birthday' and costs \$1.30 more, so each letter must cost \$0.65. <b>[1]</b> This means that the fixed fee must be <u>\$8.50</u>	2

Question	Answer	Marks
2	Dividing into groups of 20, 6 and 1 yields <u>\$159</u> which is the lowest possible.  <i>1 mark for \$160 (e.g. groups of 20 and 7)</i>	2

Question	Answer	Marks
3	The options available are: Daphne: (ch,co), (ch,l), (ch,m), (ch,s), (ch,v), (co,l), (co,m), (co,s), (co,v), (l,m), (l,s), (l,v), (m,s), (m,v), (s,v). Eric: (l,m), (l,p), (l,s), (l,v), (p,m), (p,s), (p,v), (m,s), (m,v), (s,v). <i>1 mark for obtaining at least 6 options from 1 list.</i>  OR  Totals are Daphne: 15, Eric: 10 <i>2 marks for either correct value identified with the person.</i>  $15 - 10 = \underline{5}$ .	3

Question	Answer	Marks
4(a)	( <i>Slings And Arrows</i> will finish at 16:57, so) their second film will be the ( <i>Take Arms</i> ) 17:10 <b>[1]</b> which will finish at <u>18:43</u> .	2
4(b)(i)	(6 screenings $\times$ 250 seats =) <u>1500</u>	1
4(b)(ii)	500 tickets were available at \$8 <b>[1]</b> So at least ( $\$6760 - \$4000 =$ ) \$2760 <b>[1]</b> came from a minimum of 552 tickets sold at \$5 each, the minimum number of tickets that could have been sold yesterday for Studio 2 is <u>1052</u> .	3

Question	Answer	Marks
5	Two weeks ago the 'Horde' was \$125 and the prize money was \$60 ( $\$20 \times 3$ ), so last week's 'Horde' was $\$125 - \$60 + \$125 = \$190$ . <b>[1]</b> Last week's prize money was $\$35 \times 2 = \$70$ . <b>[1]</b> So this week's 'Horde' will be $\$190 - \$70 + \$125 = \underline{\$245}$ .	3

Question	Answer	Marks
6	The number of daffodils ( $d$ ) = $t + 2$ The number of hyacinths ( $h$ ) = $t - 5$ <i>1 mark for both correct relations</i> Therefore $3t - 3 = 54$ <b>oe [1]</b> The number of tulips is 19, so <u>21</u> daffodils grew.  <i>Search method:</i> <i>The criteria for the search are (<math>t = h + 5</math> AND <math>d = t + 2</math>) and total = 54.</i> <i>1 mark for an initial search that meets either one of the criteria</i> <i>1 mark for an adjustment that gets closer to the solution</i>	3

Question	Answer	Marks
7(a)	The successive times on Bill's clock will be: real time 2:00: 2:00 real time 3:00: 2:30 real time 4:00: 2:50 <i>1 mark for this time or better</i> real time 5:00: 3:05 real time 6:00: 3:17 real time 7:00: <u>3:27</u>  <i>SC: 1 mark for seeing all of 30, 20, 15, 12 and 10</i>	2
7(b)	The successive times on Bill's clock will be: real time 3:30: 2:30 real time 4:00: 2:40 real time 5:00: 2:55 <i>1 mark for this time or better</i> real time 6:00: 3:07 real time 6:30: <u>3:12</u>  <i>SC: 1 mark for seeing all of 10, 15, 12 and 5</i>	2

Question	Answer	Marks
8(a)	23 visits to the pool cost Rebecca $23 \times \$4 = \$92$ . With a Splash! card she would have paid $\$25 + (6 \times \$2) + (17 \times 1) = \$54$ . <i>1 mark for either \$92 or \$54.</i> $\$92 - \$54 = \underline{\$38}$	2
8(b)	The cheapest price will be such that 4 visits would cost the same either with or without the card. <b>[1]</b> 4 visits without the card would cost \$16, so the monthly price of the card would be <u>\$12</u> .  <i>SC: 1 mark for final answer of \$14 (makes 5 visits cheaper but not cheapest possible).</i>	2

Question	Answer	Marks
9(a)	20% of the district must have voted for independence <b>[1]</b> and that constituted 80% of those who voted, so % who voted is 25% % who voted against is $25 - 20 = \underline{5\%}$	2
9(b)	20% and 5% voted: % who did not vote is <u>75%</u>	1
9(c)	$15/75 = \underline{20\%}$	1

Question	Answer	Marks
10(a)(i)	6 m	1
10(a)(ii)	12 m	1
10(a)(iii)	Second case has bed of river straight from bank, other has flat bottom; it cannot be both.	1
10(b)(i)	20 m <b>[1]</b> between 25 m and 45 m from the Scylla bank / between 15 m and 35 m from the Charybdis bank <b>[1]</b>	2
10(b)(ii)	12 m	1

Question	Answer	Marks
11(a)	<u>\$4800</u> ( $96 \times 5 \times \$10$ )	1
11(b)	<p>286 points (<math>81 + 77 + 65 + 63</math>) were scored from 80 questions (<math>96 - 16</math>). A search reveals that <math>(61 \times 5) - (19 \times 1) = 286</math>, therefore the total number of correct answers was <u>61</u>.</p> <p><i>The criteria for the search are {total score = 286} and {total questions = 96 OR correct + incorrect = 80}</i>  <i>1 mark for <b>using</b> total of individual scores (286)</i>  <i>1 mark for an initial search that meets either one of the criteria for the totals</i>  <i>1 mark for an adjustment that gets closer to the solution</i></p> <p><i>If no marks scored, 1 mark for any individual's score achieved with 24 or fewer questions</i></p>	4
11(c)	<p>Clare won 50% of the prize pot, so it was \$4100.            286 points were scored in the show, adding \$2860 to the pot.  <i>1 mark for either value.</i>            At the start of the show the pot contained <u>\$1240</u></p>	2

Question	Answer	Marks
12(a)	55 preferring A to B means that 45 preferred B to A, and this includes 40 with B first choice. Hence the number with order CBA is 5.	1
12(b)	ABC is 25 [1] ACB is 25 [1] BAC is 15 [1] BCA is 25 [1] CAB is 5 [1]	5