CAMBRIDGE
International Education

Cambridge International AS & A Level

THINKING SKILLS **9694/11**

Paper 1 Problem Solving **May/June 2024**

MARK SCHEME

Maximum Mark: 50

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 May/June 2024 series for most Cambridge IGCSE, Cambridge International A and AS Level and Cambridge Pre-U components, and some Cambridge O Level components.

This document consists of **9** 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 descriptions 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'.

Units

Unless required by the question or mark scheme, units such as $ do not need to be seen to award the marks.

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:

AG answer given (on question paper)
awrt answer which rounds to
dep mark depends on earlier, asterisked (*), mark
ft follow through (from earlier error)
oe or equivalent
SC special case
soi 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 it is helpful to clarify the marking.

	Correct item
	Incorrect item
	Individual mark of partial credit
	Double mark of partial credit
	Essential element of answer/working missing
	Judged to be not good enough to earn the relevant credit
	Benefit of doubt
	Correct follow through
	Transcription error
	Special case
	Working seen but no credit awarded; blank page checked
Highlight	Use anywhere it is helpful to clarify the marking

Question	Answer	Marks
1	9:15 until 12:30, there are 9 slots 13:15 until 16:05 there are 8 slots 17 slots in total *1 mark for any one of these* × 5 computers = 85 slots	**2**

Question	Answer	Marks
2(a)	\$1750 – \$1400 = \$350 **[1]** \$350/5 = 70 km	**2**
2(b)	1000 – 700 = 300 300/5 = 60 km 61–100	**1**
2(c)	150 km at old rate was 700 + 150 × 5 = 1450 \$450/50 km = \$9 per km	**1**

Question	Answer	Marks
3(a)	There will be 6 gaps of 2 minutes, an interval of 25 minutes and playing time of 90 minutes, so a total of 127 minutes Concert will end at 21:37 *1 mark for 21:39 (extra gap) OR 127 seen OR 12 AND 90 seen OR 102 seen*	**2**
3(b)	1 mark for any valid example: [AEFH and BCDG] OR [20, 6, 10, 9 and 11, 5, 14, 15] [ACDE and BFGH] OR [20, 5, 14, 6 and 11, 10, 15, 9] [ABCH and DEFG] OR [20, 11, 5, 9 and 14, 6, 10, 15]	**1**
3(c)	Sam: playing time of 50 minutes, less 5%, so 47.5 minutes Tom: playing time of 40 minutes, plus 10%, so 44 minutes Total time is 91.5 minutes, so 1.5 minutes longer *1 mark for 1.5 OR 47.5 OR 44 OR 91.5 OR 2.5 less OR 4 more*	**2**
3(d)	Longest time is when Tom conducts 4 longest pieces. Tom: 60 minutes OR Sam: 30 minutes **[1]** Tom's pieces is 10% of 60 = 6 minutes more Sam's time is 5% of 30 = 1.5 minutes less Concert is 4.5 minutes longer, so 131.5 minutes *SC: 1 mark for final answer of 94.5 OR 106.5* *If 0 scored, award 1 mark for final answer of 21:41:30*	**2**

Question	Answer	Marks
4(a)	Number of days for walk is 376/16 = 23.5 27 March	**1**
4(b)	Number of days rowing is 376/24 = 15.7 *1 mark for 15 (days) OR 16 (days) OR 11 March* Matt needs to start on 12 March *Award 2 **ft** marks for 15 days before their **(a)*** *Award 1 **ft** mark for 16 days before their **(a)***	**2**
5	The maximum spend in the shops is 4 × 3 × \$25 = \$300 **[1]** The highest average comes from 3 grandchildren With ice creams she spent \$102 per grandchild	**2**

Question	Answer	Marks
6(a)	(Total number of correct answers + 'passes' =) 37 **[1]** (33 × 5) – (4 × 2) = 157, so the number of correct answers is 33	**2**
6(b)	12 *1 mark for sight of any of the following:* *32 × 5 – 2 × 2 (= 156)* *34 × 5 – 7 × 2 (= 156)* *36 × 5 – 12 × 2 (= 156)*	**2**

Question	Answer	Marks
7(a)	\$28	**1**
7(b)	\$23 *1 mark for (100 – '28')/5 OR (100 – 23)/5 OR 5C + 23 > 100 oe seen* *OR Clive = \$16*	**2**
7(c)	David must have spent \$6 **[1]** so the total is \$48 OR C + 7 = 2(C + 1), C = 5 **[1]** total is 5C + 23 = \$48	**2**

Question	Answer	Marks
8(a)	(10, 5) (9, 6) (8, 7)	**1**
8(b)	Chris, Hassam, Ellen	**1**
8(c)	8 and 5 *2 marks for answer of 8 OR answer of 5 with no extras* *OR* *1 mark for (final score) 93, 94, 95 OR (score) 42, (43), 44*	**3**

Question	Answer	Marks
9(a)	Hider has 0 marbles in hand and guesser guesses 5 Hider has 5 marbles in hand and guesser guesses 0 Hider has 5 marbles in hand and guesser guesses 5 (or guesses correctly) *1 mark for any one correct in a list with no more than one incorrect*	**2**
9(b)	*1 mark for Sara has 8 (and Joe has 2) marbles* *OR 1 mark for 3 correct possibilities listed, with none incorrect* Sara hides — Joe guesses 0 — 2,3,4,5 1 — 3,4,5 2 — 0,4,5 3 — 0,1,5 4 — 0,1,2 5 — 0,1,2,3 *1 mark for any 3 rows correct* *OR 1 mark for all 8 possibilities that differ by 2* 20 possibilities	**3**

Question	Answer	Marks
10	Total cost for the magazines will be $(3 + 26 × 10) = $263 **[1]** He has $65 in savings so needs another $198 **[1]** OR He has spent $23 from his savings on the first three issues, has $42 (left) **[1]** He needs 24 more issues at $10 each, so needs to save another $198 **[1]** This means he needs to save $198/6 = $33 every 4 weeks	**3**

Question	Answer	Marks
11(a)(i)	Pru put at least <u>240</u> coins in her jar (8 × 30)	**1**
11(a)(ii)	The smallest number of coins that total \$2.70 is 6 (5 × 50¢ + 1 × 20¢) (so) the smallest possible total number of coins is <u>180</u>	**1**
11(b)	<u>\$202 / 20200¢</u> *2 marks for 260 50¢ coins OR 360 20¢ coins* *OR* *1 mark for a search attempt 12N + 8(N + 100) evaluated for any N > 160* *OR* Algebraic approach: 12*x* + 8(*x* + 100) = 6000 **oe** (where *x* = number of 50¢ coins) **[1]** *x* = 260 **[1]** <u>\$202 / 20200¢</u>	**3**

Question	Answer	Marks
12	<u>27</u> *1 mark for identification of any 8 correct cases in a list with no more than 2 incorrect*	**2**

Character position		
1st	2nd	3rd
1	1	1, I, i
	I	1, L, l
	i	1, L, l
I	1	1, L, l
	L	1, L, l
	l	1, L, l
i	1	1, L, l
	L	1, L, l
	l	1, L, l

Question	Answer	Marks
13(a)	Everyone who has a sports card has a dinner card (so there are not more sports cards than dinner cards)	**1**
13(b)	Candidates need to provide one true and one false case; or provide both false cases and explain that every other case would be true *Option 1:* This could be true – for example, if 90 students had a dinner card and no others **[1]** It could also be false – for example, if 95 students had both a dinner card and a sports card, 5 of whom also had a library card, because then there would be an equal number of dinner cards and sports cards **[1]** *Option 2:* The only way it could be false is if the other 90 students all had both a dinner card and a sports card **[1]** or both a dinner card and a library card **[1]** *Statement 'only way' implies that all other cases are true*	**2**