CAMBRIDGE
International Education

Cambridge International AS & A Level

THINKING SKILLS **9694/33**

Paper 3 Problem Analysis and Solution **May/June 2025**

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 2025 series for most Cambridge IGCSE, Cambridge International A and AS Level 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.

Annotations guidance for centres

Examiners use a system of annotations as a shorthand for communicating their marking decisions to one another. Examiners are trained during the standardisation process on how and when to use annotations. The purpose of annotations is to inform the standardisation and monitoring processes and guide the supervising examiners when they are checking the work of examiners within their team. The meaning of annotations and how they are used is specific to each component and is understood by all examiners who mark the component.

We publish annotations in our mark schemes to help centres understand the annotations they may see on copies of scripts. Note that there may not be a direct correlation between the number of annotations on a script and the mark awarded. Similarly, the use of an annotation may not be an indication of the quality of the response.

The annotations listed below were available to examiners marking this component in this series.

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.

Annotation	Meaning
	Correct item
	Incorrect item
1	Individual mark of partial credit
2	Double mark of partial credit
^	Essential element of answer/working missing
NGE	Judged to be not good enough to earn the relevant credit
BOD	Benefit of doubt
FT	Correct follow through
TE	Transcription error
SC	Special case
SEEN	Working seen but no credit awarded; blank page checked
Highlighter	Use anywhere it is helpful to clarify the marking

There must be at least one annotation on each page of the answer booklet.

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.

Supporting working is **not** needed to gain full marks, unless otherwise stated in the mark scheme.

If working clearly shows, beyond any doubt, that a correct answer derives purely from incorrect reasoning, that answer may be invalidated, unless otherwise stated 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.

Incorrectly labelled work

If the candidate has labelled their work with the wrong Question/part number, highlight the label(s) and add a comment to flag it. This will help avoid confusion for anyone checking the script later on.

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

Question	Answer	Marks
1(a)	Trina received \$40 for 7 more questions than the other two, so she received \$40 for 18 questions (and the other two 11 each) **[1]** $18 \times \$40 + 22 \times \$30 =$ <u>\$1380</u> ***Alternative solution:*** *1 mark for sight of trial and improvement, beginning with two equal amounts and one slightly larger* leading to \$1310, \$1310 and <u>\$1380</u>	**2**
1(b)	The contestants' totals add up to ($\$1290 + \$1270 + \$1240 =$) \$3800 **[1]** They would add up to \$4000 **[1]** if all 40 were answered correctly by at least one contestant Discrepancy $2 \times \$100$	**2**
1(c)(i)	Tracey's \$1240 for 34 correct answers was made up only of a combination of \$50 and \$30 *1 mark for any pair of multiples of \$50 and \$30 with a sum of 34, OR a total of \$1240, evaluated correctly* *1 mark for a second trial with an improved result* $11 \times \$50 + 23 \times \$30 = \$1240$ (so) the number of questions answered correctly by all three is <u>23</u> ***Alternative solution:*** $x + y = 34$ **oe [1]** $50x + 30y = 1240$ **[1]**	**3**
1(c)(ii)	40 – 2 (nobody) – 1 (Una only) – 23 **ft** = <u>14</u> **ft**	**1**
1(d)	$5 \times \$990 = \$4950$ **[1]** $6 \times \$1040 = \$6240$ So (the minimum number of questions she must answer is) 6 **[1]** ***Alternative solution:*** *1 mark for a correct algebraic expression, e.g.* $n(1190 – (9 – n)\,50)$ So (the minimum number of questions she must answer is) 6 **[1]**	**2**

Question	Answer	Marks
2(a)	(88 – 10) / 3 = 26 **[1]** 90 % of 26 = 23.4 < 25 **[1]** ***Alternative solution:*** Mollie: (88 – 10) / 3 = 26 **[1]** 90 % of 26 = 23.4 Frank: 1.1 × (99 – 12) / 3 = 31.9 Mollie's rating of 23.4 is less than Frank's 31.9, so not chosen **[1]**	**2**
2(b)	John's party has a rating of 31 Frank's party has a rating of 31.9 *1 mark for either rating calculated correctly* Since 31 < 31.9, John's party will not be chosen **[1]**	**2**
2(c)	135 – 9 = 126 and 126 ÷ 4 = 31.5 31.5 < 31.9 < 31.5 + 3.15 1 or 2	**1**
2(d)	31.9 × 2 = 63.8 **[1]** The fee must be more than 63.8 + 6 = 69.8 $70	**2**
2(e)	(69 – 5) ÷ 2 = 32 (109 – 5) ÷ 4 = 26 *1 mark for both scores* So 2 additional hours increases the score by 6 3 for each hour	**2**
2(f)	25 + 3 × 5 = 40	**1**
2(g)	Under the new system, Frank's party is the best of the others with a score of 46.9 **[1]** The lowest score Wendy's party could be given is: (135 – 9) ÷ 4 = 31.5 31.5 – 3.15 = 28.35 28.35 + 4 × 5 = 48.35 **[1]**	**2**
2(h)	Polly's party would have a score of (180 – 5) / 5 = 35, reduced by 10 % to 31.5 **[1]** plus the fixed amount of 25 = 56.5 To achieve a score of 56.5 would require a fee of (56.5 – 20) **[1]** × 4 + 7 = $153 *1 mark for calculating the score for Quentin's for two choices of fee with improvement towards their value of Polly's score* *SC: 2 marks for final answer $133*	**3**

Question	Answer	Marks
3(a)	5 / 12 **oe**	**1**
3(b)	LLL	**1**
3(c)	Third and fourth, who both use Beng **[1]** The third cannot be Dikdik, as that would require the fourth to be a right turn **[1]** The fourth cannot be Dikdik as that must be one of the first two Ls, and there have to be two Rs before another **[1]** *OR* The third cannot be Dikdik, as that would require the fourth to be a right turn **[1]** Hence the fourth must be Beng as Dikdik would have sent the driver right **[1]** *OR* The fourth cannot be Dikdik as that must be one of the first two Ls, and there have to be two Rs before another **[1]** Since the fourth and one of the first two are L/Beng, the third must be Beng **[1]**	**3**
3(d)	*Any sequence RRLRRLRR, all from Dikdik, with an extra R at any point from Beng and with each driver's system identified*	**1**
3(e)	4 **[1]** *Any sequence LRLRL from Beng, with LRRL from Dikdik interspersed in any way and with each driver's system identified* **[1]**	**2**
3(f)	156 / 3 (52) if all D, 156 / 2 (78) if all B *1 mark for either* (57 – 52) / (78 – 52) = 5 / 26 **oe** ***Alternative solution:*** *1 mark for* $x + y = 156$, $x/2 + y/3 = 57$ 30 / 156 **oe**	**2**

Question	Answer	Marks
4(a)	$28	1
4(b)	$30	1
4(c)(i)	There must be at least two 1–day tickets, so the remaining 42 tickets must have a total cost of $1020 **[1]** If all 42 journeys used 5–day tickets then a total of $1260 would have been paid Substituting 5 of these for 1–day tickets reduces the amount taken by $110 Substituting 1 of these for a 3–day ticket reduces the amount by $10 *1 mark for either substitution* So substituting for 1–day tickets reduces the total more rapidly **[1] soi** Therefore maximum number of 5–day tickets is if two sets of five are changed to 1–day and two are changed to 3–day 44 tickets 12 × 1–day tickets, 2 × 3–day tickets,30 × 5–day tickets ***Alternative solution:*** Any valid combination of tickets costing $1036 **[1]** Any valid combination of tickets costing $1036 with a number of tickets closer to 44 **[1]** Any valid combination of 44 tickets costing $1036 **[1]** 12 × 1–day tickets, 2 × 3–day tickets, 30 × 5–day tickets	4
4(c)(ii)	If no further 1–day tickets were sold then the $1020 for 42 tickets would have to be a combination of $20 and $30 **[1]** $1020 would be 51 × $20 Exchanging sets of three 3–day tickets for two 5–day tickets: 24 × $20 + 18 × $30 = $1020 18 is the minimum number of 5–day tickets	2
4(d)	1–day tickets bought on Thursday 3–day tickets bought on Tuesday 3–day tickets bought on Wednesday 5–day tickets bought on Monday	1
4(e)(i)	On Friday 136 / 8 = 17 1–day tickets were sold **[1]** Therefore the number of 3–day tickets bought on Wednesday plus the number of 5–day tickets bought on Monday must be 92 – 17 = 75 **[1]** On Thursday 112 / 8 = 14 1–day tickets were sold Therefore the number of 3–day tickets sold on Tuesday must be 130 – 14 – 75 = 41; 41 × $20 = $820 so the remaining $24 must have been for 3 1–day tickets **[1] AG**	3
4(e)(ii)	Of the 81 journeys on Tuesday, 3 were with 1–day tickets bought that day and 41 were with 3–day tickets bought on that day, then the number of 3–day and 5-day tickets bought on Monday must have been 81 – 3 – (**ft** *their 4(e)(i)*) 41 = 37 **[1]** Therefore seven 1–day tickets must have been bought for $56 37 tickets costing a total of $980 and costing $20 or $30 each **[1]** Which must be 13 × $20 + 24 × $30 = $980, so 24 5–day tickets	3