



Cambridge International AS & A Level

THINKING SKILLS

9694/11

Paper 1 Problem Solving

May/June 2020

MARK SCHEME

Maximum Mark: 50

Published

Students did not sit exam papers in the June 2020 series due to the Covid-19 global pandemic.

This mark scheme is published to support teachers and students and should be read together with the question paper. It shows the requirements of the exam. The answer column of the mark scheme shows the proposed basis on which Examiners would award marks for this exam. Where appropriate, this column also provides the most likely acceptable alternative responses expected from students. Examiners usually review the mark scheme after they have seen student responses and update the mark scheme if appropriate. In the June series, Examiners were unable to consider the acceptability of alternative responses, as there were no student responses to consider.

Mark schemes should usually be read together with the Principal Examiner Report for Teachers. However, because students did not sit exam papers, there is no Principal Examiner Report for Teachers for the June 2020 series.

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

Cambridge International is publishing the mark schemes for the June 2020 series for most Cambridge IGCSE™ and Cambridge International A & AS Level components, and some Cambridge O Level components.

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:

AG	answer given (on question paper)
awrt	answer which rounds to
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 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
Highlight	Identifies the part of the working to which another stamp pertains

Question	Answer	Marks
1	Since the two birthdays are 15 days apart, it must be that the first lunch is on a Saturday and the second lunch is on a Sunday. 5 days after a Saturday is a <u>Thursday</u> .	1

Question	Answer	Marks
2(a)	$(50 \times (100 + 90 + 80 + 70 + 60 + 50) + 200 \times 40) = \$30\,500$	1
2(b)(i)	$499 \times \$100 + \$70 = \$49\,970$	1
2(b)(ii)	$500 \times \$70 = \$35\,000$	1
2(c)	Total number sold = 5 times the number sold on Sunday, less $40 + 80 + 120 + 160$. [1] 5 times number sold on Sunday = $500 + (40 + 80 + 120 + 160) = 900$, So number sold on Sunday = 180 and number sold on Thursday = <u>20</u> OR $x + (x - 40) + (x - 80) + (x - 120) + (x - 160) = 500$ oe [1] $5x = 900, \quad x = 180$ Number sold on Thursday = <u>20</u>	2

Question	Answer	Marks
3(a)	The 'Drawn' column of the current table adds up to 24. Each drawn match features twice in this column, so the number of drawn matches is <u>12</u> .	1
3(b)	20 points, 6 wins, 0 draws [1] $20 = 2 \times 4 + 4 \times 3$, so 2 wins away from home [1]	2
3(c)	Porcupines scored 2 goals and had 1 goal scored against them. [1] Only Lemmings scored 1 goal and had 2 goals scored against them. [1]	2

Question	Answer	Marks
4(a)	The restrictions only prevent them from staying at the Village hotel. The next cheapest for a double room with breakfast is <u>Coral</u> .	1
4(b)	Coral is no longer acceptable as it does not have a gym. Plaza: $\$210 + \$140 = \$350$. Garden: $\$205 + \$150 = \$355$. So the least they could pay is <u>\$350</u> <i>1 mark for identifying the Plaza and the Garden are the two possibilities.</i>	2

Question	Answer	Marks
5	The only 6-digit number that satisfies all the conditions is <u>281357</u>. <i>1 mark for deducing any of the numbers that follow the correct construction but do not have all digits different:</i> 200941 221045 241149 261253	2

Question	Answer	Marks
6	Comparison of the two clocks before and after the change shown reveals that on the last digit of the platform 2 clock the top right element is permanently on and the bottom left element is permanently off. <i>1 mark for evidence of both</i> As a result only 1,3,4,7 and 9 display correctly. [1] <i>Allow one error, addition or omission for 1 mark.</i> This means that the displays on both clocks are identical for 5 out of every 10 minutes and, therefore, <u>30</u> minutes of each hour.	3

Question	Answer	Marks
7(a)	Least number when all pay maximum: All adults at \$40 each: $18\,000/40 = \underline{450}$ people	1
7(b)	Greatest number when cheapest tickets sold: All family tickets [1]: $18\,000/120 = 150$ groups of 4, so <u>600</u> people	2
7(c)	Each child accompanied by adult, so 160 adults and 160 children: Least cost with family tickets, so need 80 [1] Leaves 119 adults: least cost with group tickets, so need 12 [1] Total = $80 \times \\$120 + 12 \times \\$350 = \underline{\\$13\,800}$ <i>SC: uses 9 individual adult tickets rather than 12th group ticket = \$13 810</i> <i>Award 2 marks</i>	3

Question	Answer	Marks
8(a)	My change when ordering a cup of coffee and one slice of carrot cake is \$1.80. 3 'fish' + 3 'cats' = \$1.80, so 1 'fish' + 1 'cat' = 60¢, which means that one of these two coins must be 50¢ and the other one must be 10¢. [1] For 5 'fish' to be part of the \$1.80 change on the second morning, the 'fish' cannot be the 50¢ coin, so the 'cat' coin is the <u>50¢</u> .	2
8(b)	The change from \$5 is 1 'cat' (50¢), so the cost of a cup of coffee and two slices of cake is \$4.50. The cost of a slice of cake is therefore \$1.30 and a cup of coffee is <u>\$1.90</u> . FT from (a): If answer to (a) is 25¢, accept \$1.65. If answer to (a) is 10¢, accept \$1.50. If answer to (a) is 5¢, accept \$1.45.	1

Question	Answer	Marks
9(a)	4 students [1] 9, 7 7, 6 4, 3 8, 7 <i>1 mark for any two of these four specified</i> <i>2 marks for any three of these four specified</i>	3
9(b)	One student obtained the same score in English and Science.	1

Question	Answer	Marks
10(a)	Dave's time on the new route compared to the old is 1.26/1.4 [1] = 0.9 Hence journey time reduced by <u>10%</u>	2
10(b)	Journey time on old route is $10 \times 6 = 60$ minutes and on new route is 54 minutes (0.9 hours) <i>1 mark for either 60 or 54</i> Length of old route = $0.9 \times 70 = 63$ km. This is 26% longer than old route which is therefore 50 km. <i>1 mark for either 63 or 50</i> Hence new route is <u>13</u> km longer than old route.	3

Question	Answer	Marks
11(a)	First train from Dinton that arrives at Carrow after 12:00 is the <u>08:45</u> .	1
11(b)	All trains from Dinton that are travelling between 12:00 and 15:30. So 08:45 to 15:15, a total of <u>14</u> .	1
11(c)	The 10:00 will have travelled for 15 minutes longer, so distance 20 km [1] Divide 280 into two parts differing by 20, so 150 and 130, giving distance <u>150 km</u> . OR: Speed of trains = $280/3.5 = 80$ $80T + 80(T - \frac{1}{4}) = 280$ [1] $T = 15/8$, distance from Carrow is $80 \times 15/8 = \underline{150 \text{ km}}$.	2

Question	Answer	Marks
12(a)	Marian works 7 hours a day, so a total of 42 hours. Number of complete frames in this time is <u>8</u>	1
12(b)	Marian: $60/5 = 12$; Beth: $60/3 = 20$; Carrie $60/4 = 15$ frames Total 47 AG	1
12(c)	Marian completes after 5, 10, 15, 20, 25....hours Beth completes after 3, 6, 9, 12, 15, 18, 21, 24, 27hours Carrie completes after 4, 8, 12, 16, 20, 24....hours. 27 hours [2] <i>1 mark for promising systematic approach</i> 3 days and 6 hours, so <u>Thursday at 16:00</u>	3
12(d)(i)	47 frames in 60 hours: identify 13th frame needed [1] This is made by <u>Beth</u>	2
12(d)(ii)	Number of hours = 78 [1] Number of frames made by Beth = $20 + 6 = 26$ [1]	2