

THINKING SKILLS

<p>Paper 9694/11 Problem Solving</p>
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Key messages

Candidates should be encouraged to show their working and not just write down answers. Most questions are worth more than a single mark, and partial marks are available for intermediate steps in the working, even though the final answer may be incorrect.

Tidy presentation of work will not only help the candidate to work accurately but will also help the Examiner to follow the thought process of the candidate with a view to being able to award partial marks.

When an explanation is asked for in a question where numbers are involved, as is usual on Paper 1, it is almost always the case that candidates should engage with these numbers as the core of their explanation.

General comments

In general, the responses of the candidates were very variable in quality. There were some very good scripts showing a pleasing proficiency in problem solving. Other candidates attempted almost every question but their efforts were marred by misunderstanding or misinterpretation of the given information. Candidates are advised to read the questions carefully and take note of each piece of information. The candidates scoring low marks had generally not attempted many of the questions.

Comments on specific questions

Question 1

- (a) The majority of candidates knew that they needed to find a combination of seven charges of either \$8 or \$6 with a sum of \$54, and correctly identified the charges as 6 at \$8 and 1 at \$6. Often the correct answer was written down without any clear working. Other candidates used a trial and improvement approach.
- (b) With the new charging system, the majority of candidates identified that 4 wet days and 3 dry days gave the desired total charge of \$47.

Question 2

- (a) About half of the candidates used the information in the final column of the table to calculate the maximum number of marks that 2 short, 2 medium and 1 long question might have. In each case, the upper end of the range of possible marks in each category needs to be taken. This gives a total of 8 marks for the short questions, 12 marks for the medium questions and 9 marks for one long question, a total of 29 marks.
- (b) Only a very few candidates were able to identify the maximum number of marks for a single part question as 7 marks. This comes from a long question with the highest possible number of marks (9) but with the lowest possible number of parts (3) and two of these parts each being worth a single mark.
- (c) Very few candidates gave a satisfactory answer to this part. The key was to realise that if this **part (c)** had not been in the question, then the first two parts alone could not constitute either a short question, which has only one part, or a medium question, which requires a minimum of 3 marks.

The inclusion of this part means that this is a question with 3 parts and 3 marks and so can be classified as a question that meets the requirements of a medium question.

Question 3

- (a) Just over half of the candidates worked through the information in the table and were able to list the days on which Robbie did each of the activities.
- (b) To minimise the length of time from the beginning of Art to the end of Baking, Annabel must opt for the Art session which begins at 14:30 followed by the Baking session which begins at 16:45 and ends at 18:45. This minimum length of time is therefore 4 hours 15 minutes. There are four possible start times for Art, so a methodical approach is to calculate the length of time required in each case.
- (c) About one-quarter of the candidates were able to see that by switching the order of the activities and starting Baking at 14:30, followed by Art at 17:00, five minutes could be saved. This is because the start time of the second activity is 15 minutes later than in **part (b)**, but the length of the second activity is 10 minutes less, so five minutes is gained. For candidates who were not able to spot this, it was still possible to look at the possible times for Baking followed by Art and find the least length of time as in **part (b)**. This time is 4 hours 10 minutes, or five minutes less than in **part (b)**.

Question 4

Over 60 per cent of candidates found the correct answer of \$2.05. There were several common errors which resulted from misunderstanding or misapplying the given information. Some candidates used the lower cost for each of a pair of repeated letters, so two Es at \$0.20 each rather than the first at \$0.30 and the second at \$0.20. Some candidates used only the cost for the second of a pair of repeated letters, so just \$0.20 in total for both Es and \$0.15 in total for both Ls. A few candidates thought that the cost for a repeated letter needed to be added onto the cost of two letters, so the cost of two Es was given as $\$0.30 + \$0.30 + \$0.20$, and similarly for the Ls.

Of those candidates who used the correct individual costs for the letters, there were a surprising number of arithmetical errors in addition.

Question 5

- (a) Two-thirds of the candidates answered this part correctly. The first step was to work out the ages of the children at the time of the visit. The cost of entry could then be calculated from the entry charges in the given table. The most common error was to omit the entry charges for the adults, Mr and Mrs Jones.
- (b) The majority of candidates were able to work out the new total for the entry charges in this part. However, many candidates did not answer the question that was being asked: 'how much more would the total cost of the entry charges be?'. Instead, candidates simply gave the new total cost of \$217.
- (c) Only a minority of candidates negotiated this part successfully. It was necessary to work out the difference in total cost of the entry charges on each of Ollie's birthday and on Lottie's birthday.

Question 6

Only a minority of candidates made any progress in this question. In problems of this type, where fractions are involved, a recommended method is to assume first an appropriate number for the total number of people. The number chosen should take account of the fractions that are involved. In this case, halves, thirds and quarters are involved, so the number chosen should be divisible by 2, 3 and 4 and not too small. A good choice would be 48 or 96. Then, from this number, the numbers of people in each category can be worked out. For example, half of the crowd support the Reds and a quarter support the Blues, so if the chosen number in the crowd is 48, 24 support the Reds and 12 support the Blues and 12 support neither. Continuing this process it can be found that 8 wear red hats, 3 wear blue hats and 6 wear black hats. So, the proportion of the people wearing hats that are Reds supporters is 8 out of $(8 + 3 + 6)$ or 8 out of 17.

A few candidates chose to work with fractions, but with little success.

Question 7

- (a) There were only a handful of correct answers to this part. Most candidates did not understand the scenario and either gave the answer 4, probably because it is the length of time between leap years in general or gave no answer at all.
- (b) This part proved to be too difficult for all except a couple of candidates.

Question 8

- (a) Most candidates wrote down the distances covered by Gilmesh and Hercules in successive minutes.

For Gilmesh these are, in metres, 300, 290, 280, 270, 260, 250, 240, 230 and so on.

For Hercules they are 200, 205, 210, 215, 220, 225, 230, 235 and so on.

The differences in these distances are 100, 85, 70, 55, 40, 25, 10, – 5. Candidates made the incorrect deduction that the answer to the question must be 100 metres after 1 minute. In fact, the distances that matter are the total distances covered by each at the end of successive minutes. For Gilmesh these are 300, 590, 870... and for Hercules they are 200, 405, 615.... So the differences between the distances travelled are 100, 185, 255, 310, 350, 375, 385, 380... The maximum is therefore 385 metres after 7 minutes.

Of course, it is not necessary to write down the individual distances, as the result can be deduced by noting that Gilmesh's lead decreases by 15 metres each minute, starting from 100 metres.

- (b) Continuing the pattern set up in **part (a)** leads to the correct answer of 15 minutes, when Hercules is first in the lead. The minority of candidates who had been successful in **part (a)** were usually correct with their answer this part.

Question 9

- (a) Just over 50 per cent of the candidates obtained the correct answer of 41. The usual method applied was trial and improvement to find three ages which a difference of 8 between the higher two, a difference of 11 between the lower two and a sum of 120. Some candidates set up a simple algebraic equation to solve the problem.
- (b) Only a small minority of the candidates obtained the correct answer of 64, with over 50 per cent of the candidates offering no solution. Those that were successful used trial and improvement.

Question 10

From this point on in the paper there were an increasing number of omissions.

- (a) Half of the candidates answered this correctly, realising that the six particles of the same colour would combine in three pairs to produce three units of energy.
- (b) Only a minority of candidates obtained the correct answer of 10 units of energy. The common solution seen was to combine each blue particle with a red particle and obtain three green particles and six units of energy. Some candidates went on to combine two of the green particles to produce another unit of energy. This is a possible sequence of collisions, but it is not the optimum one. Other possible sequences of collisions need to be explored, for example, bringing in the green particle produced from red and blue to the second collision.
- (c) Those candidates who were successful in **part (b)** were usually able to apply their process to this different scenario.
- (d) This was only attempted by a small percentage of candidates and few were successful.

Question 11

One-third of the candidates omitted this question.

- (a) Most candidates added up the numbers of wrappers with each of the different letters except N inside, giving the total 48 000. However, this is not the answer to the question, which states that 80 per cent of the wrappers contain the letter N, so this total of 48 000 only accounts for 20 per cent of the total number. The total number of wrappers with a letter printed inside is 48 000 times 5 or 240 000.
- (b) A minority of candidates realised that THOUSAND is constrained by the numbers of the letter S, namely 50. This means that only 50 thousand dollars can be paid out in prizes for the word THOUSAND. Very few candidates went on to consider the HUNDRED and TEN options.

Question 12

This question was found to be very challenging and correct answers were a very rare sighting. The majority of candidates did not attempt to answer the question.

Question 13

About half of the candidates attempted this question, but there were few correct answers. Some candidates realised that 50 cars parking for the maximum price \$3.50 would result in an income of \$175, leaving another \$75 to be collected. This can be achieved from 50 cars parking at 08:00 for 30 minutes at \$1 and another 25 parking at 08:30 for 30 minutes for \$1. If 50 cars then park at \$3.50 at 09:00, the total income is \$75 plus \$175. So the target can be achieved by 09:00. The \$75 can be achieved from 50 cars parking at 08:00 for 1 hour at \$1.50. It can be seen from these figures that the target cannot be achieved before 09:00.

THINKING SKILLS

<p>Paper 9694/12 Problem Solving</p>
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Key messages

Where candidates have made several attempts at a question, it needs to be clear what they are offering as a final solution.

Candidates regularly cross out all working and just give a final answer, which can prevent them from being awarded partial credit where the final answer is incorrect. Only working which candidates do not want the Examiner to mark should be crossed out.

Candidates need to read the questions very carefully, as all the information given needs to be used to reach a correct final answer.

General comments

A wide range of marks were seen. The candidates scoring low marks generally had not attempted the majority of the questions.

Comments on specific questions

Question 1

Most candidates attempted this question. The most successful candidates wrote out a clear step by step timetable with the meetings and lunch shown and fitted the training sessions around them. Candidates who did not show a clear timetable and did not arrive at the correct final answer were usually unable to be awarded partial credit, as it was unclear when they were fitting the training sessions into the day.

Candidates who made the assumption that all training sessions would last the full 45 minutes were still able to pick up a mark for showing only two sessions could be fitted in before the first meeting.

The most common error seen was candidates assuming all the training sessions would last only 30 minutes, leading to three sessions being fitted in before the first meeting and a final finish time of 12:30.

Question 2

- (a) (i) This part of the question was attempted by almost all the candidates, with over a third of them answering successfully. Most candidates managed to work out the bus travel times of 27 minutes on route A and 9 minutes on route B correctly, although not all that did this were able to deal with the potential wait times for the buses. The most common incorrect assumption was that the buses arrived at multiples of 10 minutes past the hour, so after working out that the route A journey time was 27 minutes they added a further 3-minute wait before bus B could be taken.
- (ii) Over three-quarters of candidates attempted this question. Candidates who did not score on **part (a)(i)** generally also did not score on this part. The most common misconception was that only the ten-minute wait for bus B had to be taken into consideration, so the maximum ten-minute wait for bus A was frequently missing.
- (b) Candidates who answered **part (a)(ii)** correctly generally also answered this part of the question correctly. Several candidates who used only one of the ten-minute wait times in the previous part

were able to correct their thinking and obtain the mark. This could be because they were thinking about two different wait times rather than the same wait time repeated.

Many candidates started each part of this question from scratch and repeatedly worked out the travel times found in **part (a)(i)** and did not realise they only needed to add the wait times on to the answer found in **part (a)(i)**. Follow-through marks were available.

Question 3

Most candidates attempted this question, with about a third of them scoring full marks. The most successful candidates split their work into two obvious sections and looked at the effects of going to Stephanie's mother first, then her father first.

The most common error seen was not considering the number of *complete* \$10 and \$20 collected. The amount raised was divided by \$10 or \$20 and the full decimal number used to work out how much extra Stephanie was given.

Several candidates only looked at one of the situations and did not compare both.

Question 4

(a) Most candidates attempted the question and over half of those scored full marks. The first mark was awarded for candidates recognising that the longest journey would arise from the taxi driving directly away from the office during its journey. The candidates who recognised this generally went on to score full marks, with only a small number scoring 1 mark because of arithmetic slips in their calculations.

The most common error was for the candidate to assume that the distance travelled back to the office was the same as the distance travelled from the office before the journey.

(b) The success rate for this part of the question was not as high as for the previous part. The most common error seen was candidates using the journey price found in the previous part of the question rather than finding the cost for the journey at the new price. Several attempts were seen to divide the previous cost by 0.16 or 1.6.

Question 5

(a) Nearly all candidates attempted this question, with a significant majority of them obtaining the correct answer. The methods used seemed fairly evenly split between those who continued the table so they had a complete listing of points for all the athletes and those who just worked out the points for the required places.

(b) This is a question requiring an explanation and about 10 per cent of candidates did not attempt it. 'Explain' question responses need to be clearly laid out so the reasoning can be followed, and whilst a number of candidates looked to be heading in the right direction, they did not explain what their calculations meant. The first mark was easily obtained on this question, as all that was necessary was to show the two unknown finishers needed to score a total of 32 points between them, so it was slightly surprising that more did not obtain this mark.

(c) About a fifth of candidates made no attempt at this question. Although the question is worth three marks, the first of the marks could easily be obtained by considering any three evenly spaced positions and looking at the points obtained. The two main reasons this mark was not obtained are firstly that candidates had evenly spaced the points, rather than the finishing positions, and secondly, if evenly spaced finishing positions had been listed, the number of points obtained from them was not given.

The most successful candidates tended to use a trial and improvement method.

Question 6

(a) Almost all candidates answered this question and the majority were successful finding the number of moves required to move the disc from the start to finish position.

- (b)(i) About 90 per cent of candidates attempted this question. Many gave no working out at all and just gave a single number as an answer. The question is worth two marks so candidates should be aware that showing their working is helpful and gives the potential for partial credit if the question is not answered correctly. There was little evidence to show that the diagram had been used by most candidates.
- (ii) Fewer candidates attempted this part of the question than the previous parts. The most successful candidates split the journey into two parts and worked out that there were four routes from the start to the centre and then another four routes from the centre to the finish point. A few candidates found this out but added the values together rather than multiplying them.

Candidates need to read questions carefully, as many seemed to think they were only looking for the number of ways from the start point to the centre.

Question 7

- (a) Most candidates attempted this question. The most successful responses seen usually worked out that Estefania had swum the whole length of the pool whilst Ashly had swum half, and then worked out where they would meet once they were swimming in opposite directions. Candidates who tried to use algebra were rarely successful, because of the change of direction that would have to be taken into account.
- (b) This question was most easily tackled by finding where the two swimmers first meet, after which it is a case of multiplying this by 5. Few candidates were able to answer this correctly. A number of candidates worked with where the two swimmers met at the ends of the pool and ignored the times; they met in the centre of the pool so an answer twice as big as expected was seen. Few candidates tried to answer the second part of the question with algebra, although a few did try to use fractions. A common incorrect answer was 100 obtained from dividing 60 by 3 and multiplying by 5.

Question 8

- (a) About 80 per cent of candidates attempted this question, with the majority being unable to successfully answer it. Despite the example being given, many candidates ignored it completely and gave four toilet statuses (which is the number of displays) rather than three.

It was also common to see answers using green and red rather than vacant and occupied.

- (b) After finding the previous part challenging, more candidates did not attempt this part. The candidates who did were generally more successful with this part of the question. There were still some candidates showing three colours rather than the four required in each example. Some candidates ignored the instruction to give three examples and some lost marks by including additional, incorrect examples.

Question 9

- (a) Most candidates answered this question and the majority scored full marks. Most candidates took the obvious path of adding the scores and dividing by three to see what score each group needed. Some candidates misunderstood the question and wrote the position of each person down and added these instead of the scores.
- (b) Fewer candidates attempted **part (b)**. The most successful candidates jotted down what the information told them, such as the two groups scoring 80 or more meant that the total score had to be 160 or more, meaning the missing candidate must score less than 20; and as the two groups scored the same, the total score is even, meaning the missing candidate is even. Candidates writing either piece of information were able to score a mark, even if they went on to choose the wrong pairing. The most common incorrect pairing seen was Ewan and Fred, with no working. There is a good chance that candidates did take into consideration that the score needed to be below 20 to come up with these answers but as there was no evidence this was what they had done, they could not be credited.

Question 10

Candidates found this question difficult, with most attempting the first part but about a third not attempting the second part. The biggest difficulty seemed to be deciding when to work with question *parts* and when to work with *marks*.

- (a) Little method was seen for this question. Some of the most successful candidates had made jottings next to the table and could clearly be seen working out which of the short, medium and long questions gave them the most marks per part. Once they had decided the short questions gave them the maximum of 4 marks per part, whereas the other question types could only give a maximum of 3 marks per part, the question was easily finished.
- (b) Very few candidates who attempted this question scored. It is a question that requires an explanation. Candidates should look at the bits of information given and consider each bit and explain what it tells them.

For example, we know that the number of short questions is 4 and there must be 9 questions in total.

The number of long and medium questions must therefore add up to 5.

We are also told there must be different numbers of each question so there cannot be 4 long or medium, so only possibilities at this point are

(Long, Medium) = (5,0), (3,2), (2,3), (0,5).

The other pieces of information about marks and parts will reduce the options further until only (2,3) remains.

Question 11

Candidates were now approaching the end of the paper, where the questions are more challenging and time constraints would have more of an effect, so more candidates left questions unattempted from this point.

- (a) About 80 per cent of candidates attempted this question, with over half of those who did scoring full marks. Those who did not score often misinterpreted the initial explanation phase of the biscuit making and thought that both Jason and his friend would make a batch each during the first hour and a half, rather than just Jason making one. Candidates working in batches rather than individual biscuits were less likely to make arithmetic errors.
- (b) Just over two-thirds of candidates attempted this question, as those who found **part (a)** challenging did not tackle the following parts. Some marks were obtained by the majority of those who attempted it. The most successful candidates made a simple table to keep track of what was happening by the end of each hour. This not only enabled the candidate to keep track of their thoughts but also gave clear evidence where partial credit could be awarded. Candidates who were less logical in their layout often did not provide sufficient evidence for partial credit. One of the most common errors was the first friend not starting baking until the second friend had also been trained, leading to one fewer batch in the first three hours.
- (c) Just over half of the candidates attempted this question. Again, the most successful candidates broke the question down and looked at what the situation was at the end of each hour or half hour. A significant number of candidates put a time down with no working at all, suggesting they were possibly guessing.

Question 12

This is the final question on the paper, with about a third of the candidates not attempting either part. The most successful candidates were the ones who tried to organise their thoughts with simple jottings to help them.

- (a) The candidates were finding the number of tickets with two of the digits being 5. Candidates who used the very simple strategy of making a simple table with headings 55_, 5_5 and _55 seemed able to organise their thoughts better and were more successful. Some additionally put the options in the blank spaces, for example 55(012346789), 5(012346789)5 and (12346)55 leading to 23 different options. The most common error was to see 555 counted at least once, and often three times.

- (b) Fewer candidates attempted this part of the question, giving up after being unable to progress with **part (a)**. The question is an extension to the first part, and **part (a)** should have given them an indication that they needed to find the number of ways with one digit being a 5 and the number of ways with all three digits being a 5 to make progress. Most candidates that attempted the question were able to point out that there was only one ticket with three 5s on it; however, it was commonly thought that there were 600 tickets in total rather than 601.

A small number of candidates attempted to work out the number of tickets with no 5s and subtract that, the answer found for two 5s from **part (a)** and the one ticket with three 5s. These were generally the stronger candidates.

THINKING SKILLS

<p>Paper 9694/13 Problem Solving</p>
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Key messages

Candidates should be encouraged to show their working and not just write down answers. Most questions are worth more than a single mark, and partial credit is available for intermediate steps in the working, even though the final answer may be incorrect.

Tidy presentation of work will not only help the candidate to work accurately but will also help the Examiner to follow the thought process of the candidate with a view to being able to award partial credit.

When an explanation is asked for in a question where numbers are involved, as is usual on Paper 1, it is almost always the case that candidates should engage with these numbers as the core of their explanation.

General comments

Many candidates attempted all of the questions and there were many answers of a pleasingly good standard. Most of the candidates were able to engage with many of the questions in a meaningful way.

Comments on specific questions

Question 1

Most candidates answered this correctly. The first step is to realise that the driving speed is double the walking speed and then, since these speeds differ by 5km/h, the walking speed must be 5km/h and the driving speed 10km/h.

Question 2

Most candidates answered this question well. There was an occasional slip in switching between units.

Question 3

- (a) The majority of candidates answered this correctly. Buses numbered 5 arrive at Delta Street at 12, 27, 42 and 57 minutes past each hour and buses numbered 11 arrive at 04, 24 and 44 minutes past each hour. It can be seen from these times that the shortest gap is between the arrivals at 42 and 44 minutes past the hour. A small number of candidates found the times between the arrival of a number 5 bus and the arrival of a number 11 bus, in the order given in the timetable: 07:12 to 07:44 is 32 minutes, 07:27 to 08:04 is 37 minutes and so on.
- (b) Most candidates showed that the first bus was the 14:24, which would arrive at Bravo Lane at 14:55, followed by the 15:03 from Bravo Lane, which would arrive at Tango Park at 15:16. A similar calculation starting with the 14:27 leads to an earlier arrival time of 15:06 at Tango Park.

Question 4

50 per cent of the candidates answered this question correctly; the other 50 per cent did not make any progress. The key is to realise that there is a 25-hour possible time difference because of the time zones (11 plus 14) and that the birth can take place from 00:00 to 23:59 on any given day. This gives a total possible difference in the actual time of birth of 48 hours 59 minutes (rounded to 49 hours).

Question 5

- (a) Almost all candidates answered this correctly giving 'son, daughter' as one example where the second child is the favourite of both parents at the same time.
- (b) The simplest example of when a child will never be the favourite of either parent is with two children in the order 'daughter, son'. The most common incorrect answer was 3, with a variety of combinations of sons and daughters offered.
- (c) More than half of candidates solved this problem. For each of the sons to have been favourite, they must each be older than the first daughter. Then, Bonnie is the middle of three sisters, so there must be one older sister and one younger sister.

Question 6

- (a) Most candidates gave the correct answer of 15 matches.
- (b) Just over half of the candidates answered this correctly. The total length of the day is 490 minutes, so the playing time can be found by subtracting the time taken for the intervals from this. There are 15 matches, so there are 14 intervals each of 5 minutes, giving a total interval time of 70 minutes and a total playing time of 420 minutes. But the normal playing time for 15 matches is 300 minutes, leaving 120 minutes 'extra' time. This is accounted for by 12 matches that are draws. The most common errors were to include 15 intervals or to divide the extra time of 120 minutes by 15, assuming an interval between the normal playing time and the extra time.

Question 7

Both parts of this question were answered correctly by most candidates. The few incorrect answers were not supported by any working so it is not possible to define any errors in thinking.

Question 8

Almost all candidates answered this question correctly. The common approach was to set up a pair of simple linear simultaneous equations and solve them. A few candidates used a trial and improvement method and quickly arrived at the correct answer.

Question 9

- (a) Most candidates answered this part correctly. The Swirler is open for 8 hours or 480 minutes. The time taken for a ride and disembarking is 6 minutes, so there are $480/6$ (80) rides per day. Each ride can carry 12 people, giving the greatest number of people who can ride on the swirler as 960 per day. A minority of candidates included an extra ride beginning at 18:00 although the question states that the final ride ends at 18:00.
- (b) Most candidates answered this part correctly. Since there are 53 people in the queue, Jacob will be on the fifth ride which starts after 10:20. This is the 10:48 ride. A minority of candidates assumed, incorrectly, that 10:20 was the starting time of a ride and so obtained the answer 10:44.
- (c) This part required candidates to work in reverse from the closing time of 18:00. A queue of 60 people accounts for five full rides, so the person joining the queue would need to be in the sixth ride after their arrival. This is the 17:24 ride. The common error in this part was to assume that the person joining the existing queue was the 60th person, leading to an answer of 17:30. The existing queue can already have 60 people in it, so five rides will already be full.
- (d) About half of the candidates answered this correctly. The worst scenario for Lee is that two places are always taken by visitors with Priority Passes so there are ten other places per ride. Lee is 73rd in the queue, so he will be on the 8th ride that starts after 11:27 (so at 11:30). This is the 12:12 ride. Some candidates missed the fact that only two Priority Passes were allowed per ride. Another error was to assume that Lee would be on the 7th ride after 11:27.

Question 10

- (a) 75 per cent of the candidates answered this correctly. Most used fractions with, for example, Hans cleaning one-quarter of the glass in one hour and summed to find that two-thirds of the glass could be cleaned in one hour by the four people. Some candidates used decimal equivalents, some chose an arbitrary area for the glass and worked out how much glass each person would clean per hour. A minority of candidates added together the given times and claimed that it would take 35 hours if all four people were cleaning. A little thought should have told that that this was not a sensible answer.
- (b) This part was answered correctly by those candidates who had negotiated **part (a)** successfully. The remaining candidates either omitted this part or made no progress in answering it.

Question 11

- (a) The majority of candidates scored full marks in this part. Two methods of approach were seen. In the first approach, Gino walks 170 km in the first 7 days, so in 28 days he will walk 680 km. On 29th, which is a Tuesday, he will walk 30 km, followed by 20 km on 30th, a total distance of 730 km. This leaves 45 km to walk on the final day. In the second approach, the daily distances walked are subtracted from the total distance, 775 km. Up to 30th August there are 5 Wednesdays and 21 other walking days (and 4 Sundays). The distance covered on 31st is $(775 - 5 \times 20 - 21 \times 30)$ km, so 45 km.
- (b) Fewer candidates were successful in this part of the question than in **part (a)**, with just over a third scoring full marks. Some candidates identified the correct number of days of walking as 39 or that Kim would finish on the 46th day, but then did not convert this correctly into a day and date. Several candidates identified the correct date as 15th September, but did not give the day, as required in the question. Those candidates who did not have a systematic approach to the problem rarely made any meaningful progress.

Question 12

- (a) Just over 50 per cent of candidates answered this correctly, by first identifying how nine of the 1st class letters could be posted using the five 40 cent stamps and then the four 30 cent stamps together with four 10 cent stamps. The remaining lower denomination stamps can be used for the final 1st class letter and then as many 2nd class letters as possible.
- (b) One-third of the candidates answered this part correctly, finding that, by using the 30 cent stamps for 2nd class letters, an extra two letters can be posted. The remaining candidates either omitted this part or made little progress.

Question 13

This question proved challenging for candidates and there were very few fully correct answers.

- (a) Less than half of the candidates made any progress in this part. The most successful attempts were by those candidates who used an algebraic approach.
- (b) Very few candidates attempted this part and of those only a couple were successful. Again, an algebraic approach was used.
- (c) Very few candidates attempted this part.

THINKING SKILLS

Paper 9694/21
Critical Thinking

Key messages

Although this exam to some extent tests generic skills, which are developed as by-products of the study of other subjects, it is impossible to perform well in the exam without studying the specification, preferably with the aid of the endorsed textbook and with reference to previous question papers and mark schemes. In particular, it is necessary to know such items as reliability criteria and the meaning of the expressions 'argument', 'argument element' and 'appeal'.

Candidates who do approach a question in the right way are often content to achieve only 1 mark when 3 or 4 are available. For example, questions about reliability always have several valid points which can be made and so it is not a good strategy to be content with only one.

General comments

This paper in the November session has always attracted a significant proportion of candidates whose performance fell far short of any plausible pass mark, apparently because they did not know what they were expected to do in response to the various types of question, and there were many such candidates this year.

A significant number of candidates omitted at least one question, especially **Questions 3c, 3d** and all parts of **Question 4**.

Comments on specific questions

Section A

Topics for **Section A** may be drawn from any academic discipline. On this occasion, the subject area was social psychology.

Question 1

- (a) (i) Most candidates gave plausible answers to this question and were awarded 2 marks. A few answers were considered to be vague or speculative and were awarded 1 mark. Tautologous answers, such as 'because they were more valuable', and answers which ignored the contrast between 'big money' and small amounts or no money, such as 'because they were honest', were not credited.
- (ii) A key word in this question was 'alternative', but most candidates overlooked or did not understand the significance of this word, and either gave answers which were contained in Source B or suggested reasons why people may have 'deliberately kept the money for themselves'. Such answers were not credited, because they were not 'alternative'. It would help candidates if they knew that the command word 'suggest' means they are being asked to think of an answer for themselves, rather than locating it in the source material provided (which would be expressed by the command word 'identify'). Furthermore, answers based on Source B referred to China only, but the question and acceptable answers were not restricted in that way. Some other answers were not credited because they were incompatible with the scenario as described in Source A.
- (b) (i) Most candidates judged correctly that Source B was an argument, but many gave explanations which were unrelated to the specialised meaning of the word 'argument' used in Critical Thinking,

saying, for example, that it is an argument because it opposes Source A or defends the Chinese people.

- (ii) Some candidates realised that they were expected to answer this question with reference to the reliability criteria listed in the specification, but many apparently did not. Simple mentions of reliability criteria, without any explanation of how they applied to the source, were not credited. However, answers which used the concepts of the reliability criteria without the correct terminology were credited. Most candidates evaluated the content of the source, instead of its reliability. As on previous occasions, the presence or absence of statistics was a popular wrong answer. Some candidates misunderstood the expression 'Chinese Master's candidate'.
- (c) Most candidates were more impressed by Source C than it deserved, and did not make the evaluative comments which were identified on the mark scheme. Some evaluated the source from the perspective of reliability criteria instead of focussing on the effectiveness of the response to the claim from Source A. A popular wrong answer was that Source C responds ineffectively to Source A because it contradicts it.
- (d) Many candidates claimed that the fact that payments rose significantly when a picture of eyes was displayed justified the inference that 'People are more likely to be honest if they think someone is watching them,' but they did not explain how this inference could be drawn and were therefore awarded 0 marks. Relatively few candidates recognised how unlikely it is that anyone should literally think that a photograph of eyes is watching them. Some candidates were misled by the word 'reliably' to answer this question with reference to reliability criteria.

Question 2

Most candidates adopted a moderate position, such as agreeing 'to a certain extent', rather than simply supporting or challenging the claim; although this was acceptable, a few conclusions were so tentative and equivocal as to be meaningless. As on previous occasions, a few candidates made good use of evaluation of sources and/or inferential reasoning, but most achieved only 2, 3 or 4 marks out of 8, because they did no more than draw a conclusion based on some or all of the sources and perhaps some personal thinking unrelated to the sources. Most candidates unrealistically accepted the claims of all the sources at face value. Sources A and D were used far more than the others. A significant minority of candidates ignored the instruction, 'using and evaluating the evidence provided' and used only their own ideas, which severely limited the mark they could achieve. Some candidates interpreted 'honest' as meaning 'truthful', which made it difficult for them to make use of the sources. Although some candidates followed the advice that they should plan their answers before writing them, most appeared to be thinking as they wrote and did not express a coherent and consistent opinion.

Section B

Question 3

- (a) A fair number of candidates identified the sentence containing the main conclusion, but almost all of them quoted the whole sentence instead of only the second half and were therefore awarded only 1 mark out of 2. A few also included either the preceding or the following sentence, and were awarded 0 marks. There were many wrong answers and a significant minority of candidates expressed in their own words, and usually at some length, what they understood to be the gist of the argument instead of identifying the main conclusion.
- (b) A fair number of candidates correctly identified one intermediate conclusion, but very few gave two correct answers. Some candidates quoted the whole of the second sentence of paragraph 1, instead of only the first half. The first sentence of paragraph 2 was a popular wrong answer: although this does directly support the main conclusion, it is itself unsupported and therefore does not constitute an intermediate conclusion.
- (c) Many candidates paraphrased the quoted words or section of the argument instead of identifying the argument element, while other answers identified flaws instead of an argument element. These mistakes most probably occurred because the candidates did not know what the expression 'argument element' meant.

- (d) Several correct answers were available, and some candidates gave one or other of them as their answer. Some candidates quoted words from the passage, which by definition could not constitute an 'unstated assumption'.

Question 4

As on previous occasions, many candidates achieved 0 marks on this part of the exam, apparently because they did not know what the questions meant or the kinds of answers which could have been correct. On this occasion, unusually, none of the questions relied on knowing the name of a weakness or flaw.

- (a) The two correct answers in this case, namely appeals to authority and popularity, are amongst the best known types of appeal, but few candidates gave these answers. Many of the answers given did not identify appeals at all, which suggested that candidates probably did not know the meaning of the word, while others used technical terms from rhetoric instead of Critical Thinking. Many candidates quoted from paragraph 1, without naming or evaluating the appeals.
- (b) A fair number of candidates were awarded 1 mark on this question, but very few achieved 2 or 3. Some candidates pointed out that the passage emphasises the communal aspect of one or other of the life events, but did not generalise their statement sufficiently to receive a mark.
- (c) A fair number of candidates judged correctly that a single example was insufficient evidence to justify the generalised claim, but very few probed any more deeply and identified any of the other evaluative points which were available. It appeared on the basis of answers to this question that many candidates had not followed the reasoning in paragraph 4 of the passage.

Question 5

Most candidates chose to support the claim.

A wide variety of standards was achieved. Some answers had a clear and purposeful structure, but most were undeveloped or consisted of a stream of consciousness. Some candidates concluded, 'I support the claim', or 'I agree with the claim', neither of which constituted a persuasive conclusion. Not many candidates made appropriate use of 'additional argument elements' (examples, evidence, analogies, counters with response or hypothetical reasoning), while even fewer constructed their strands of reasoning to support intermediate conclusions. Some candidates lost marks by using rhetorical questions in place of intermediate conclusions.

Some of the weakest answers consisted of the candidate's unstructured ideas on the subject, which were not used as reasons to support a conclusion and were therefore not credited. A small number of candidates based their argument on the passage provided as the basis of **Questions 3** and **4**, which was not the intention of this exercise, and they were awarded 0 marks.

THINKING SKILLS

Paper 9694/22
Critical Thinking

Key messages

The wording of the questions presupposes that candidates understand the terms used in the specification, including the names and descriptions of basic flaws or weaknesses. This includes knowing the differences between the Critical Thinking and the everyday senses of the expressions ‘argument’ and ‘assumption’.

Candidates who appeared not to know what they were expected to do in response to various question formats often paraphrased the source material or expressed their own reactions to it.

Before committing their responses to paper, it is essential for candidates not only to read the questions carefully, but also to take time to consider their responses, especially for **Questions 2** and **5**. Some candidates clearly did this, with plans for their responses to these questions laid out beforehand or at the end of the exam booklet. However, others appeared to have started writing almost immediately, resulting sometimes in quite lengthy responses being struck through and restarted. In the case of **Question 5**, such haste appeared to be the reason for ‘stream of consciousness’ arguments being offered, which were often poorly structured and repetitious.

General comments

The majority of candidates offered responses to all the questions on the paper. Where questions were not attempted, this was usually for **Question 3(c)** or for a single part of **Question 4**, although a handful of candidates did not attempt **Question 5**.

Comments on specific questions

Section A

Question 1

- (a) Roughly half of the candidates recognised that Source A is not an argument. To get both marks, candidates had also to explain why it is not an argument and what the function of the source actually is. Hence, and as shown in the mark scheme, there are three points to be made to obtain full marks; however, relatively few people who recognised that the source is not an argument made both of the other two points adequately. Some candidates gave a generic response, merely pointing out that Source A is not an argument because it does not contain a conclusion. Others confined themselves to stating that Source A is not an argument, without explaining the basis of this (correct) judgment, but stating what it is doing instead, i.e., providing information about the proposal to reintroduce wolves to Scotland. To get credit for identifying the function of Source A, candidates had to state that it is imparting information, although they did not need to state what the information is about (better responses did do this). Responses referring merely to the source ‘providing facts’ were not close enough for credit.

Candidates who responded that the source is an argument often gave as the main conclusion the first sentence of the second paragraph of the source. This sentence is simply making a statement that is amplified in the remainder of the paragraph. Some candidates incorrectly viewed Source A as arguing that wolves *should* be reintroduced to Scotland.

A few candidates who judged that the source is not an argument gave the incorrect explanation that this is because it does not contain a counterclaim or two opposing viewpoints. Such answers

were not given any marks, even if they correctly identified that the source does not contain a conclusion or that it was imparting information; this is because the judgment was based on the everyday sense of the word 'argument', rather than its meaning in Critical Thinking.

- (b) Many candidates misunderstood what they were being asked to do here, interpreting the question as being about reliability and applying the reliability criteria to Source C. Although they often applied these effectively to the source, no credit could be given because they were not answering the question as stated. Other candidates confined themselves to paraphrasing the information provided in the source or quoting it verbatim, but without using this information to identify ways in which it either supports or fails to support the concerns of the farmers. For example, it was common to see responses pointing out that the Norwegian study states that 34 per cent of the 20 000 sheep had been killed by wolves, but not going on to suggest that this figure is quite large and gives some support to the idea that wolves may be a threat to Scottish sheep farmers. Perhaps the candidates thought that the point was too obvious to need articulating, but it did need to be made explicit for credit to be given. Other candidates incorrectly judged that the concerns are not justified because the study implied that 66 per cent of sheep kills were by predators other than wolves, that is, wolves were responsible for a 'small' proportion of the deaths. Many candidates made no explicit reference to the fact that Source C refers to Norway, not Scotland, and many of the answers appeared to be based on the assumption that the statistics relate to Scotland.

The best responses generally focused on the fact that roughly one-third of the kills had been caused by wolves, a significant portion, and, just as in Norway, sheep farmers in Scotland could also be forced out of business by wolf predation. Although, on the other side, they recognised that conditions in Norway may be relevantly different to those in Scotland.

- (c) Few candidates obtained many marks here. The key to success was grasping that the question was about the practicalities of accessing the enclosed area after the fence had been erected and gates installed. The mark scheme shows the points that were available for consideration. The most common creditworthy answer was along the lines that, as the number of gates would have to be fairly limited, access would be restricted to a certain extent compared to what it was before.

Many candidates suggested that access would be restricted because the walkers would be apprehensive about entering an area known to contain wolves, and this would effectively bar them from venturing into it. Nevertheless, not only does Source A make it clear that wolves are normally a negligible threat to humans, but the concerns of walkers referred to in Source D relate primarily to the fencing-off of a large area of land in which they had hitherto enjoyed unimpeded access. No reference is made to walkers feeling imperilled by entering the enclosed area.

Other responses appeared to presuppose that walkers would not be allowed into the area at all, sometimes referring to the fact that 'No proposal has yet been made to permit free access to the fenced-off area to the general public'.

As with **Question 1(b)** above, a few candidates wrongly interpreted this question as being about reliability, whereas, because it was specifically asking about plausibility, the focus of correct responses needed to be about the likelihood of the claim quoted from the source being true, regardless of how reliable (or otherwise) the source itself was deemed to be.

- (d) This question had a wide scope, giving candidates the opportunity to apply the reliability criteria to Source E, as well as assessing the plausibility of the points made by the farmer. Generally, candidates were able to identify some creditworthy points here, with the best responses also getting the mark available for making a correct judgment supported by points covering both sides of the issue, demonstrating how credibility is enhanced by some features of the source and weakened by others.

It is worth drawing attention here to a feature of many responses limiting the marks that were awarded. It is not enough to state, for instance, that the farmer is likely to possess 'expertise'; to get a mark for making this point, it is important to identify the nature of this expertise. In this source, the expertise was in sheep-farming (although there was separate credit available for pointing out that he is less likely to have expertise in the ecological issues raised by the proposal to reintroduce wolves). Likewise, mere mention of 'ability to see' did not by itself get credit. It was essential to identify *what* he is able to see. Along the same lines, a simple attribution of 'bias' or 'vested interest' needs to say what the likely outcome of this is, if credit is to be obtained.

Question 2

Candidates' responses to this question were split fairly evenly between support and challenge to the claim provided. Many made some use of at least four of the five sources, thereby getting the two marks available for use of sources. Unlike in **Question 5**, a separate mark is awarded here for a clearly stated conclusion (provided that some support is also given for it). Going beyond the three marks available for using at least four sources to support an explicitly stated conclusion required either (a) some inferential reasoning from the source material, (b) some evaluation of this material, or (c) some independent thinking. There were some very good examples of the latter, with candidates commenting on the fact that reintroducing wolves to Scotland would make their global survival as a species more secure, or making points about the ecological advantages of the scheme that were at a higher level than those made in the sources.

As with **Question 1(d)** above, otherwise good attempts at evaluation were often not given credit because the candidates had not properly focused their attributions of, for instance, expertise or vested interest. In this context, it is perhaps worth pointing out that the mere fact that a piece of source material originates from a university does not automatically invest it with enhanced reliability; this needs to be qualified by linking it with the likely possession of reputation or expertise, or perhaps vested interest to maintain a good reputation. In many responses, there was no attempt at evaluation of the sources, even though there can be up to three marks awarded for making sufficiently good evaluative points.

There are also three marks available for inferential reasoning from the sources, but instances of this were very rare. Candidates generally either did not offer any, or, where they did, the reasoning was too close to what is contained in the sources, or a conclusion drawn was almost identical to the candidate's overall conclusion. By way of example of how credit can be obtained here, two marks for inferential reasoning were given to a response that drew attention to the relatively low density of wolves required compared to that of the red deer present in the areas affected, inferring from this not only that not many wolves would be needed to cover an area of 200 km² (as given in Source D), but also that this fact may help to ease the farmers' concerns for their livestock.

Section B

Question 3

- (a) Many candidates obtained both marks for precisely stating the correct main conclusion. On the few occasions where additional material was included in a response, thereby limiting the mark awarded to one, the candidate also quoted the preceding sentence. There were various incorrect answers offered, with the most common being the final sentence of the passage, possibly because it commences 'This proves...'
- (b) Overall, this question was answered well, with the first and fourth intermediate conclusions listed in the mark scheme being the ones mostly commonly identified. Candidates who identified the second and third intermediate conclusions generally presented them as a single conclusion; however, they are separate claims, with the third one being inferred from the second. Not making the distinction resulted in the third claim being classed as additional material, resulting in only one of the available two marks being awarded. One common incorrect answer was the intermediate conclusion from the second paragraph: 'So it is not surprising that animals' needs are often neglected.' As it was outside the range of the question, no marks could be awarded, but at least its selection did show that candidates who chose it recognised it as an intermediate conclusion.
- (c) Judging by their responses, many candidates seemed not to understand what is meant by the expression 'argument element'. Many of those who did understand this expression, and who correctly identified the element as a reason (or, occasionally, a premise), judged its function to be providing support to the main conclusion of the argument. Most of the remainder stated that it was providing support to the intermediate conclusion, 'So it is not surprising that animals' needs are often neglected'. Both functions were deemed creditworthy. Of those who appeared not to understand the expression, some candidates regarded the phrase as being part of an exhortation to owners of exotic pets to take better care of them.
- (d) In Critical Thinking, an assumption is an unstated premise needed for a conclusion to be validly inferred from other premises. By definition, this precludes direct quotations from the passage, or paraphrases of such material, as being classed as assumptions in the sense demanded by the question. While this can be a common error in responses to questions of this type, relatively few candidates gave such answers here. Some candidates merely countered one of the assumptions

that underpinned the fourth paragraph, showing how the assumption is unwarranted. While they must have grasped that the assumption in question was being made, they had not answered the given question fully and were only awarded one mark. A number of the candidates correctly identified and stated one of the assumptions made, most commonly the first or fifth ones listed in the mark scheme.

Question 4

- (a) There were some good responses to this question, with candidates identifying and explaining the flaw well enough for at least two of the three marks available. Some were clearly thinking along the right lines, but did not gain credit because they stated that the two alleged causes given to explain the rise in popularity of exotic pets may not have been the *only* causes. Responses of this type often named the flaw as being ‘restriction of options’, presumably because only two possible causes were posited and there may have been others. However, this involves a misunderstanding of the nature of a causal flaw.

Some candidates incorrectly claimed that ‘unusual’ was being conflated with ‘exotic’. Others stated that the claim that the keeping of exotic pets is more common now contradicted the main thrust of the passage. Some of these answers seem to have been based on misunderstanding the expression ‘less unusual’.

- (b) Many candidates identified and clearly articulated the first of the two examples given in the mark scheme, receiving both marks available for this question. Less common, but found in a few scripts, were one- or two-mark versions of the second example. Some responses received credit for raising the objection that if trained and reared properly, most species need not be a threat to people or property.
- (c) All three appeals (or acceptable variations of them) featured in responses, with popularity and emotion appearing more often than authority. Very few candidates offered any evaluation of these, though, so although there were plenty of one-mark responses, there were hardly any responses gaining both marks. Perhaps candidates regarded the mere presence of an appeal as being a weakness in an argument; however, as the specification makes clear, arguments can be strengthened by the use of relevant and proportionate appeals. Some candidates appeared not to understand what is meant by ‘appeal’ in the Critical Thinking sense of the term, and gave a summary of the fourth paragraph.
- (d) There were several ways to gain credit in this question, and a good number of candidates managed to obtain marks here. The mostly commonly occurring creditworthy evaluations were directed to the first or last bullet points on the mark scheme, with a handful of scripts making creditworthy comments based on one or more of the other three. Wrong answers often concentrated on explaining just how it is that the keeping of exotic pets can be environmentally harmful, thereby suggesting that the purpose of the question had been misunderstood.

Question 5

Nearly all candidates made attempts to answer this question, with the majority arguing in support of the claim stated in the question. There were, however, few highly scoring responses, partly because candidates rarely structured their arguments using intermediate conclusions. There were, however, some very good uses of other argument elements, especially analogy (comparing responsibility for pets with responsibility for one’s children), examples and hypothetical reasoning. Perhaps because of the topic, candidates seemed to find it difficult to use more than one strand of reasoning. The sample arguments given in the mark scheme may be useful in this respect, showing how relatively easy it is to gain an extra mark by inserting a second strand of reasoning into a response. The conclusions of a few arguments were expressed as ‘I support...’ or ‘I agree...’, but these did not constitute persuasive conclusions, as required by the instructions for **Question 5**.

Apart from arguments from analogy (which candidates tended to push too far; a common mistake with such arguments), candidates often pointed out that pet owners make a conscious decision to buy a pet and hence must accept the responsibility that such ownership entails. The latter inference was often accepted as an intermediate conclusion from which the desired main conclusion can be easily reached. Some responses focused on the responsibility for the health and safety of pets in one’s care, usually either trying unsuccessfully, or not trying at all, to extend this to the acceptance of responsibility for the harmful actions of these pets. Very few candidates made the error of importing material given in the passage on exotic pets.

Candidates sometimes appeared to find it hard to avoid being repetitious in their arguments, often making the same point in a variety of different ways, although presumably they did not realise that they were doing this. One effect of this was to limit the number of reasons that could be credited as being separate from each other, thereby reducing the chances of getting the two marks available for offering at least three reasons.

THINKING SKILLS

Paper 9694/23
Critical Thinking

Key messages

On this occasion, most of the candidates seemed to have at least a fair idea of what the questions expected them to do. Although this exam tests skills more than knowledge, the specification does identify some subject knowledge which candidates are expected to know, and it is impossible to perform well in the exam without knowing such items as reliability criteria, the meanings of the expressions 'argument element' and 'unstated assumption' and the names of certain flaws and weaknesses in reasoning.

General comments

The candidature for this paper is always smaller than the other regions, and on this occasion numbers were too low to use as the basis for particularly reliable or instructive generalisations about performance.

Nearly all candidates attempted all the questions. They produced a wide range of achievement.

Comments on specific questions

Section A

Topics for **Section A** may be drawn from any academic discipline. On this occasion, the subject areas were gender studies and psychology.

Question 1

- (a) It was a sign of the times that candidates were unwilling to consider the possibility that the male members of the group might have actually been more intelligent than the female members. Some offered explanations for why the men in the sample might have over-estimated their own intelligence, instead of an **alternative** to over-estimation.
- (b) A lot of valid points could be made and most candidates scored 1 or 2 marks, but no one developed their answer sufficiently to achieve 3 or 4 out of 4.
- (c) (i) Just over half of the candidates judged correctly that Source C is an argument and some of them explained their answer well enough to score 2 marks out of 2, although others gave generic answers or wrongly identified the conclusion.
(ii) Because this question was open-ended in format, it was necessary to credit various answers which had not been foreseen. However, few candidates succeeded in maintaining the required clear focus on the details of Sources C and B in order to achieve 2 marks out of 2.
- (d) Most, but not all, candidates saw how the concept of illusory superiority could be applied to the issue of men over-estimating their own abilities by comparison with those of women, but not many gained the second mark by pointing out that the source itself did not make this application.
- (e) As on previous occasions, some candidates understood that they were supposed to evaluate the source in the light of the five reliability criteria identified in the specification, while others did not. Some of those who attempted the correct task made implausible judgements.

Question 2

About half the candidates scored 7 or 8 marks out of 8 for this question, by making well-judged use of evaluation of sources and inferential reasoning; a few made limited use of these skills, while a similar number scored 2 or 3, by drawing a conclusion based on either simple use of all or some of the sources or their own ideas only, without reference to the sources.

Section B

Question 3

- (a) The main conclusion was located in a prominent position and almost all candidates identified it correctly, even though it did not constitute the whole of a sentence.
- (b) Almost all candidates correctly identified at least one intermediate conclusion, and most of them correctly identified two.
- (c) Several candidates correctly identified the quoted words as a counter-assertion, while two were awarded 1 mark for saying they were a counter argument. Some candidates apparently did not know what an argument element is, while others identified the wrong element.
- (d) On this occasion, several correct answers to this question were available and two were required. Almost all candidates attempted the right task, although there were quite a lot of wrong answers.

Question 4

Although this question as usual produced weaker results than other parts of the exam, on this occasion some candidates did understand what they were being asked to do.

- (a) Some candidates evidently knew the meaning of the word 'conflation', while others did not, although it is listed in the specification as one of the flaws which candidates should be able to recognise and evaluate.
- (b) Not many candidates spotted the inconsistency between not being able to afford the cost of universal age-related pensions and allocating the expenditure to other parts of the welfare budget.
- (c) Not many candidates correctly identified the appeal in paragraph 5 as being to history. Some identified other kinds of appeal, such as emotion or bandwagon (based on 'many people think that...'), while others did not identify an appeal at all.

Question 5

A full range of marks was awarded to this question. Several candidates achieved 7 or 8 out of 8, and some of those exceeded the requirements for full marks. Many candidates made appropriate use of 'additional argument elements' (examples, evidence, analogies, counters with response or hypothetical reasoning), and some constructed their strands of reasoning to support intermediate conclusions.

Some candidates began their answers with the words, 'I agree with the claim....', but this did not constitute a 'persuasive conclusion'.

THINKING SKILLS

<p>Paper 9694/31 Problem Analysis and Solution</p>
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Key messages

Candidates should be encouraged to show their working, including a brief indication of what any significant numbers are, and not just write down their final answers. In paper 3 the working should be done on the answer booklet and not on the question paper. Working should not be crossed out unless it has been rejected and replaced by another attempt.

Paper 3 covers analysis *and* solution; in all parts of questions worth more than a single mark, partial credit is available for intermediate steps in the working, even if the final answer is not fully correct; but the working must be written down to gain credit.

General comments

Care is needed when dealing with borderline cases, and for noticing that there are $n-1$ gaps between n items in a row.

Inefficient calculation methods were often used. Not only do these waste candidates' time, they also offer scope for additional errors.

As all the questions are set in some context, more candidates would benefit from checking that the answers they give are plausible, e.g. with rooms taking 20 to 50 people it is unlikely that 499 extra people will be needed for anything, or the diameter of the smaller circle will be less than that of the given larger one. Units can also be helpful: the answer to 'how many people' is unlikely to be in dollars.

Comments on specific questions

Question 1

- (a) Most candidates correctly answered this part, and most errors were arithmetical. Some candidates calculated each daily profit and then added those, rather than simply taking the total income and subtracting the total expenditure.
- (b) (i) Almost all candidates answered this part correctly.
 - (ii) Some candidates read 'a larger room' as specifying the use of the 'Large' room and did not consider the option of Medium rather than Small.
- (c) (i) Some candidates selected the wrong extreme (half not quarter) when looking for the minimum, and others stopped having found that 30 without considering the increase of between a quarter and a half.
 - (ii) Only a few candidates addressed the guarantee on numbers; most looked no further than determining the greatest profit. This time some used a quarter not a half.

Question 2

Some candidates offered *probabilistic* reasoning, such as ‘he was unlikely to have a nine as she had three of them’. This does not fit with showing reasons why something *must* be the case.

- (a) Some candidates ignored the constraint that claims must be a multiple of 5, and so used 27 rather than 25. Others presumed that that the maximum combination they offered was unique (9 + 9 + 7 or 9 + 8 + 8).
- (b) (i) Most candidates answered this part correctly. More candidates gave a correct score for Gavin than for Olivia, some giving her score after she made a claim rather than after both had done so.
(ii) Most candidates identified both the lack of available 9 cards and that at least one would be needed for a score higher than 24.
- (c) Some candidates who did not deduce that 6 was the smallest possible number used up time to exclude each smaller number separately. Some did not consider that there might be two cards with the same number. More excluded 7 than 8.
- (d) Most candidates found at least two of the three, but a few offered more. Some answered ‘how many’ not ‘which’.
- (e) This part related to a guarantee, and thus needed more than showing it was possible for her to win. 30 per cent gave no response.

Question 3

The distinction between necessary and sufficient was often missing in the analysis. A few candidates did offer a valid *statistical* formulation, such as ‘the average is more than 7 so there must be one value of at least 8’.

- (a) Most candidates found that 9 had the desired property, but not all showed that it was the minimum, e.g. by showing 8 was not enough.
- (b) Some candidates merely gave an example that there could be 4 together, rather than addressing that there must be.
- (c) Some candidates assumed that 8 people were sitting together and then showed that this was possible.
- (d) Many candidates answered ‘does not need to be’ (40) and very few addressed ‘definitely will not be’ (100). Most candidates did not note that this differed from the earlier parts in that it was essentially looking for the worst case (with uncontrolled seating) rather than the best.
- (e) Some candidates assumed that all the constraints would apply to the optimal case, although in this case not all the information given was needed. 30 per cent gave no response.

Question 4

There were not many rules for this game, and they were not complex, but ignoring some of them led easily to wrong answers.

- (a) (i) A few candidates confused dots on tiles with points in the game, and thus made little progress on this part or on the rest of the question.
(ii) Some candidates just gave an example to show that 10 points could be made, without addressing why it could not be more.
- (b) (i) Most candidates correctly identified E as the only option. It may have seemed an unexpectedly easy question at this stage, but it was a reminder to check the rules of the game before embarking on a multi-mark part where they were critical.

- (ii) Most candidates correctly calculated both scores and identified which was which with at least an initial of the relevant player.
- (c) Reasons were rarely given, and many of the responses to this appear to have been guesses as there was no discernible pattern in the mistakes.
- (d)(i) Only half of the candidates offered a response to this part. Some candidates just showed that (the given) tiles 1 and 4 were possible, rather than that tiles 2, 3, and 5 were not.
- (ii) Some candidates offered orientations such as ‘turned to the left’ but not all meant anti-clockwise. A diagram would have removed any ambiguity.

THINKING SKILLS

<p>Paper 9694/32 Problem Analysis and Solution</p>
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Key messages

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Paper 3 covers analysis *and* solution; in all parts of questions worth more than a single mark, partial credit is available for intermediate steps in the working, even if the final answer is not fully correct; but the working must be written down to gain credit.

General comments

Care is needed when dealing with borderline cases, and for noticing that there are $n-1$ gaps between n items in a row.

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Comments on specific questions

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 - (ii) Only a few candidates addressed the guarantee on numbers; most looked no further than determining the greatest profit. This time some used a quarter not a half.

Question 2

Some candidates offered *probabilistic* reasoning, such as ‘he was unlikely to have a nine as she had three of them’. This does not fit with showing reasons why something *must* be the case.

- (a) Some candidates ignored the constraint that claims must be a multiple of 5, and so used 27 rather than 25. Others presumed that that the maximum combination they offered was unique ($9 + 9 + 7$ or $9 + 8 + 8$).
- (b) (i) Most candidates answered this part correctly. More candidates gave a correct score for Gavin than for Olivia, some giving her score after she made a claim rather than after both had done so.
(ii) Most candidates identified both the lack of available 9 cards and that at least one would be needed for a score higher than 24.
- (c) Some candidates who did not deduce that 6 was the smallest possible number used up time to exclude each smaller number separately. Some did not consider that there might be two cards with the same number. More excluded 7 than 8.
- (d) Most candidates found at least two of the three, but a few offered more. Some answered ‘how many’ not ‘which’.
- (e) This part related to a guarantee, and thus needed more than showing it was possible for her to win. 30 per cent gave no response.

Question 3

The distinction between necessary and sufficient was often missing in the analysis. A few candidates did offer a valid *statistical* formulation, such as ‘the average is more than 7 so there must be one value of at least 8’.

- (a) Most candidates found that 9 had the desired property, but not all showed that it was the minimum, e.g. by showing 8 was not enough.
- (b) Some candidates merely gave an example that there could be 4 together, rather than addressing that there must be.
- (c) Some candidates assumed that 8 people were sitting together and then showed that this was possible.
- (d) Many candidates answered ‘does not need to be’ (40) and very few addressed ‘definitely will not be’ (100). Most candidates did not note that this differed from the earlier parts in that it was essentially looking for the worst case (with uncontrolled seating) rather than the best.
- (e) Some candidates assumed that all the constraints would apply to the optimal case, although in this case not all the information given was needed. 30 per cent gave no response.

Question 4

There were not many rules for this game, and they were not complex, but ignoring some of them led easily to wrong answers.

- (a) (i) A few candidates confused dots on tiles with points in the game, and thus made little progress on this part or on the rest of the question.
(ii) Some candidates just gave an example to show that 10 points could be made, without addressing why it could not be more.
- (b) (i) Most candidates correctly identified E as the only option. It may have seemed an unexpectedly easy question at this stage, but it was a reminder to check the rules of the game before embarking on a multi-mark part where they were critical.

- (ii) Most candidates correctly calculated both scores and identified which was which with at least an initial of the relevant player.
- (c) Reasons were rarely given, and many of the responses to this appear to have been guesses as there was no discernible pattern in the mistakes.
- (d)(i) Only half of the candidates offered a response to this part. Some candidates just showed that (the given) tiles 1 and 4 were possible, rather than that tiles 2, 3, and 5 were not.
- (ii) Some candidates offered orientations such as ‘turned to the left’ but not all meant anti-clockwise. A diagram would have removed any ambiguity.

THINKING SKILLS

<p>Paper 9694/33 Problem Analysis and Solution</p>
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Key messages

Candidates should be encouraged to show their working, including a brief indication of what any significant numbers are, and not just write down their final answers. In paper 3 the working should be done on the answer booklet and not on the question paper. Working should not be crossed out unless it has been rejected and replaced by another attempt.

Paper 3 covers analysis *and* solution; in all parts of questions worth more than a single mark, partial credit is available for intermediate steps in the working, even if the final answer is not fully correct; but the working must be written down to gain credit.

General comments

Care is needed when dealing with borderline cases, and for noticing that there are $n-1$ gaps between n items in a row.

Inefficient calculation methods were often used. Not only do these waste candidates' time, they also offer scope for additional errors.

As all the questions are set in some context, more candidates would benefit from checking that the answers they give are plausible, e.g. with rooms taking 20 to 50 people it is unlikely that 499 extra people will be needed for anything, or the diameter of the smaller circle will be less than that of the given larger one. Units can also be helpful: the answer to 'how many people' is unlikely to be in dollars.

Comments on specific questions

Question 1

- (a) Most candidates correctly answered this part, and most errors were arithmetical. Some candidates calculated each daily profit and then added those, rather than simply taking the total income and subtracting the total expenditure.
- (b)(i) Almost all candidates answered this part correctly.
- (ii) Some candidates read 'a larger room' as specifying the use of the 'Large' room and did not consider the option of Medium rather than Small.
- (c)(i) Some candidates selected the wrong extreme (half not quarter) when looking for the minimum, and others stopped having found that 30 without considering the increase of between a quarter and a half.
- (ii) Only a few candidates addressed the guarantee on numbers; most looked no further than determining the greatest profit. This time some used a quarter not a half.

Question 2

Some candidates offered *probabilistic* reasoning, such as ‘he was unlikely to have a nine as she had three of them’. This does not fit with showing reasons why something *must* be the case.

- (a) Some candidates ignored the constraint that claims must be a multiple of 5, and so used 27 rather than 25. Others presumed that that the maximum combination they offered was unique ($9 + 9 + 7$ or $9 + 8 + 8$).
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- (c) Some candidates who did not deduce that 6 was the smallest possible number used up time to exclude each smaller number separately. Some did not consider that there might be two cards with the same number. More excluded 7 than 8.
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- (ii) Some candidates offered orientations such as ‘turned to the left’ but not all meant anti-clockwise. A diagram would have removed any ambiguity.

THINKING SKILLS

<p>Paper 9694/41 Applied Reasoning</p>
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Key messages

- In **Question 1**, identifying the main conclusion proved unusually difficult for candidates and many did not know how to approach **1(d)**.
- In **Question 2**, most candidates did as they were asked and attempted to evaluate the reasoning.
- In **Question 4**, most candidates created their own argument structure, rather than simply following the sequence in which the documents are presented, and some engaged *critically* with the documents provided.

General comments

Most candidates appeared to have enough time to finish the paper, with some evidence of time being used to plan answers to **Question 4**. Some candidates wrote disproportionately long answers for the earlier, lower-tariff questions. The improvement in the approach to answering **Question 1(d)** noted in previous series did not continue this series.

The standard of candidates varied greatly but there was evidence that some candidates had been well prepared.

Comments on specific questions

Question 1

All parts of **Question 1** rewarded the well-prepared candidate. Those who knew what was expected and attempted to analyse the argument usually gained between 2 and 4 of the 8 marks for analysis. Some candidates were unaware that quoting from the text is necessary for answering this question.

- (a) Most candidates knew what was required and attempted to identify the conclusion. However, perhaps because of the absence of an indicator word, few selected the correct answer. Common incorrect responses included 'all claims to uncover information about people's psychological traits are dishonest and exploitative' and 'So claims of this kind should be subjected to greater critical scrutiny'. A few answers gave the gist of the argument.
- (b) Candidates were more successful at this part of the question. However, the award of more than 2 marks was uncommon, sometimes because candidates included words that were not part of the IC they were trying to identify. For example, 'Evidently, there is no such thing as an argument in favour of astrology, since the only people who believe in it are anti-intellectual eccentrics' was frequently offered as an answer and given no credit, as the words after 'astrology' are not part of the intermediate conclusion. Most candidates followed the instruction to give only three answers. Interestingly, some candidates that stated precise and correct answers in **part (b)** went on to give paraphrased answers in **part (d)**.
- (c) Fewer than expected candidates achieved a mark here. The proportion of successful answers was slightly less than that for **part (b)**. It was evidence that some candidates who know what an intermediate conclusion was, did not know what a counter-assertion looked like.
- (d) A similar proportion of candidates to 2021 knew how to approach this question. Several still did not understand what was required. Candidates needed to identify (by stating) parts of the paragraph as individual argument elements and, for full credit, to demonstrate relationships between any

elements that had been identified. Some responses summarised the meaning of the paragraph, others evaluated it and some attempted to counter the reasoning.

Of those candidates who attempted analysis, some paraphrased the elements (rather than stating them word-for-word), some did not name the elements and some did not demonstrate relationships between them. It was relatively common for well-prepared candidates to be awarded award 1 or 2, but the award of all 3 marks was rare.

Question 2

The majority of candidates were aware of the nature of the task and attempted an evaluation for both parts of the question.

- (a) As ever, responses that directly countered points given in the argument were not credited, nor were generic statements like ‘there is no evidence to back this up’ or ‘we do not know the source’ (although there were fewer of these this series). Many candidates scored 0 but high scoring answers were seen. Marks were most commonly gained for identifying the *ad hominem* in paragraph 5 and the slippery slope in paragraph 6. A lot of candidates incorrectly identified an *ad hominem* in paragraph 4. However, the personal attack on teenagers in that paragraph was not used as a basis upon which dismiss any reasoning.
- (b) This style of evaluation question was different from the legacy syllabus but most candidates did attempt to do what was required. Many answers gained one mark, often for realizing that the conclusion of the paragraph was at least consistent with the main thrust of the argument. A few candidates gained more credit for discussing the relative strengths of the paragraphs conclusion in relation to the argument as a whole.

Question 3

Candidates appeared to know what type of answer was expected and most limited the length of their responses to match the number of marks available.

- (a) It was common to award 2 marks here, usually for a reference to the limited number of answer options with an example for a potential consequence, but 3-mark answers were rare. Some candidates attempted to criticise the link between the answers given and any inferences made from them but such responses were not credited here.
- (b) This part of the question scored less well, although versions of the first, third, fourth and sixth bullet points on the mark scheme were seen regularly. Generic responses about unknown sample size and or the credibility of the source of the information were not credited.

Question 4

Candidates were required to use the documents to construct a reasoned case to support or challenge the conclusion that ‘Everyone should find out as much as possible about their personality’. Most were able to engage with this topic, but few offered strands of reasoning beyond those given in the documents. Almost all candidates attempted to construct their own arguments, with very few relying on sequentially summarising the documents. Some candidates were able to arrange their ideas into strands of reasoning that each supported an intermediate conclusion and, hence, scored higher than level 1 for the structure skill. However, few candidates were using the documents with a critical eye, which meant the marks for ‘use of documents’ were often restricted to level 1. Most of those responses that did attempt evaluation of the documents limited their critical comments to discussions of credibility. It is worth noting that there are other approaches to evaluation, for example highlighting the circularity of the reasoning in paragraph 1 of Document 3.

Arguments supporting the conclusion were strengthened by effectively responding to potential objections about the unreliability of some personality tests; those challenging the conclusion were strengthened if they included effective responses to objections about the potential usefulness of knowing one’s own personality. Some answers focused almost entirely on dismissing the validity of a series of ‘personality’ tests and, as such, did not really address the question. It is worth reminding centres that what is likely to get high marks is a persuasive argument that addresses the conclusion given with a clear structure that is supported by thoughtful, particularly critical, use of the documents and that thoughtfully considers relevant alternative viewpoints.

THINKING SKILLS

<p>Paper 9694/42 Applied Reasoning</p>
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Key messages

- In **Question 1**, identifying the main conclusion proved unusually difficult for candidates and many did not know how to approach **1(d)**.
- In **Question 2**, most candidates did as they were asked and attempted to evaluate the reasoning.
- In **Question 4**, most candidates created their own argument structure, rather than simply following the sequence in which the documents are presented, and some engaged *critically* with the documents provided.

General comments

Most candidates appeared to have enough time to finish the paper, with some evidence of time being used to plan answers to **Question 4**. Some candidates wrote disproportionately long answers for the earlier, lower-tariff questions. The improvement in the approach to answering **Question 1(d)** noted in previous series did not continue this series.

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Comments on specific questions

Question 1

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- (b) Candidates were more successful at this part of the question. However, the award of more than 2 marks was uncommon, sometimes because candidates included words that were not part of the IC they were trying to identify. For example, 'Evidently, there is no such thing as an argument in favour of astrology, since the only people who believe in it are anti-intellectual eccentrics' was frequently offered as an answer and given no credit, as the words after 'astrology' are not part of the intermediate conclusion. Most candidates followed the instruction to give only three answers. Interestingly, some candidates that stated precise and correct answers in **part (b)** went on to give paraphrased answers in **part (d)**.
- (c) Fewer than expected candidates achieved a mark here. The proportion of successful answers was slightly less than that for **part (b)**. It was evidence that some candidates who know what an intermediate conclusion was, did not know what a counter-assertion looked like.
- (d) A similar proportion of candidates to 2021 knew how to approach this question. Several still did not understand what was required. Candidates needed to identify (by stating) parts of the paragraph as individual argument elements and, for full credit, to demonstrate relationships between any

elements that had been identified. Some responses summarised the meaning of the paragraph, others evaluated it and some attempted to counter the reasoning.

Of those candidates who attempted analysis, some paraphrased the elements (rather than stating them word-for-word), some did not name the elements and some did not demonstrate relationships between them. It was relatively common for well-prepared candidates to be awarded award 1 or 2, but the award of all 3 marks was rare.

Question 2

The majority of candidates were aware of the nature of the task and attempted an evaluation for both parts of the question.

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THINKING SKILLS

<p>Paper 9694/43 Applied Reasoning</p>
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Key messages

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General comments

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