

THINKING SKILLS

Paper 9694/22
Critical Thinking

General comments

There were many well-prepared able candidates achieving high marks. At the other end of the mark range, however, there was with quite a long 'tail' of candidates who were poorly prepared for the paper and who struggled to reach a mark in double-figures. Well-prepared candidates seemed to respond well to the issues raised by the questions and were able to tackle them effectively.

Key messages

- Some candidates identify the content of the source(s) that allows an inference to be made (which is often the answer to a question) but simply repeat it without making the inference. The effect of this is that they tend to repeat what the source says, leaving the significance still implicit and therefore fail to answer the question effectively.
- Candidates would be well-advised to always attempt **Question 3(d)** in the event of getting short of time.
- Some candidates are looking for answers from information in the sources where the question requires the application of their own thinking, for example **Question 2(a)**.

Comments on specific questions

Question 1

- (a) Only a minority of candidates tackled this question effectively. Some interpreted it as a credibility question. Others saw it as an *ad hominem* attack on Dr Kitty. Because the author was trying to establish with evidence that Dr Kitty was a con-man, this was not an argument with an *ad hominem* flaw. Those who saw it as effectively supporting the claim tended to just repeat what was in the passage and rely on accepting the implications the author intended. The key to answering the question was to see that if one questioned the implications, it was apparent that they were dubious, e.g. that an on-line course is necessarily suspect.
- (b) Most candidates gained at least one mark on this question. Candidates who gained 2 marks were more successful in making explicit how inheriting the money challenged Kitty's claim that his success was due to gaianomics.
- (c) This question was answered quite well with a significant number of candidates seeing the problem with a defence of gaianomics which seemed to give an account of a rejection of a dream rather than the realisation of it. Other points about possible bias and it being simply coincidental also featured frequently.
- (d) While most candidates argued that Kitty was a con-man, a significant minority argued the reverse. Some candidates got rather confused when they raised the admittedly difficult question of whether the book having a 'placebo' effect meant it was a con-trick or not. Some argued that Kitty knew that gaianomics was complete rubbish but that he used this as a device to write a self-help book which did help people. This meant he was not a con-man as such. Others disagreed and saw this as cynical and manipulative. Candidates who took this approach, irrespective of their final judgement, often made good use of inferential reasoning about how he may have used his psychological knowledge.

Question 2

- (a) This was quite an easy question with most candidates getting at least two reasons why governments would not tackle coastal erosion. Some candidates were helped by the fact that, on this occasion, relevant points could be gleaned from the sources. However, as noted in the key messages above, this is not normally an effective way of tackling questions like this.
- (b) Only a minority of candidates achieved 4 marks. The easiest way to achieve 4 marks was to identify and explain two factors that made global warming policy ineffective as a solution. Whilst the question did not explicitly ask one to do this, candidates need to look at the mark allocation to give them a sense of the length of answer required. A number of candidates seemed to think it was enough to say that coastal erosion was a natural phenomenon. This would not, in itself, explain why tackling global warming would be ineffective. Others raised issues of difficulties of implementation. However, the word 'achievement' should have implied successful implementation of the policy.
- (c) This question was done quite well with most candidates seeing that living on the coast did not necessarily mean living on a cliff subject to erosion and then going on to explain why this might not be the case.
- (d) Most candidates agreed with the proposition and there was plenty of evidence in the sources that building houses on cliff tops is unwise. However, some achieved a more nuanced conclusion by suggesting the claim was too sweeping and that there are probably some cliffs that do not erode because the rock is very hard. A small minority of candidates questioned the assumption that a cliff was necessarily by the sea. This was good critical thinking and was rewarded.

Question 3

- (a) Only a small minority of candidates successfully identified the conclusion and most achieved 0 marks. A rather greater number identified it as an intermediate conclusion and had therefore got part of the way to the correct answer. Such candidates would have benefited from testing whether this statement worked better as a reason to support a conclusion or a conclusion following from the reasoning. Applying this test should have led them to correctly identifying 'In the modern world one needs to get real and get planning' as the main conclusion.
- (b) In spite of not identifying the main conclusion, most candidates did identify two intermediate conclusions and seemed to therefore understand the major thrust of the argument.
- (c) By far the most identified flaw was the *ad hominem* in paragraph 2 but the assumptions in paragraphs 3 and 4 and the inconsistencies in paragraph 4 also figured frequently in the 4 or 5 mark answers. Very few candidates managed to explain the conflation in paragraph 1. Some weaker candidates challenged the statement by suggesting there was nothing wrong in setting off on a journey and not knowing where you were going. Candidates who achieved 0 marks tended to fall into two categories. Either they knew what they should be doing but could not do it – such answers tended to consist of many technical terms for flaws wrongly applied – or they did not understand the nature of the exercise. This second category of answer tended to challenge statements or comment on questions of style. Such answers are now in the minority.
- (d) Most candidates suggested clocks were necessary for life to function and that we would therefore be unhappy if we did not have them. Some thoughtful answers took the more difficult course of arguing for the proposition via the argument that 'clock time' is only necessary in a ruthless dehumanised technological society and therefore we would be happier if they had not been invented because it would mean we were in a different sort of society. On the other side, more sophisticated answers moved on from explaining things like how we'd never be able to catch a bus any more to suggesting time is an existential parameter and inventing clocks does not invent time or time pressure.

THINKING SKILLS

Paper 9694/32
Problem Analysis and Solution

Key messages

- The information in the text of questions is almost always needed at some point; most candidates would benefit from checking that they have found some use for all of the information and have not neglected important detail.
- Some candidates would gain more marks by labelling the numbers in their working, thereby allowing examiners to see evidence for partial credit more often. Doing so should also help them to detect errors.
- Candidates should attempt the parts in the order in which they are given, as earlier parts often highlight detail that is essential for a fully correct solution. However, sometimes in a scenario an avenue is explored and then excluded from further consideration; careful reading of the question is necessary to avoid carrying over assumptions or conditions that are not valid for the current part question.
- 'Explain' needs some reasoning, usually with some numeric justification, and not simply rephrasing the statement given.
- When the answer is given in the question, examiners are generally looking for a demonstration of how it is obtained; so there is no point in highlighting it, and every reason not to cross-out the working.

Comments on specific questions

Question 1

This question asked for the maximum or minimum of participants or medals for a squad with different teams, as well as finding a suitable arrangement of players into teams for various events. It was important for candidates to take care over the terminology and not to use 'team' as a generic word. Most candidates found this question harder than expected; many opted to start with a different one.

- (a) This asked for the least number so that a full complement of teams could be fielded, (so for each event multiplying the number of team by members and then taking the maximum). Many candidates simply took the minimum for an event.
- (b)(i) The number of cyclists in a particular team could be deduced by considering the total needed and how they were arranged either singly or doubling up. Few candidates did this correctly.
- (ii) An arrangement satisfying various constraints was asked for, using letters to label cyclists. Few candidates offered arrangements that satisfied 'all other cyclists must take part in exactly two events', highlighting the lack of attention to detail in the previous part. Some listed the events for each cyclist rather than the cyclist for each event, losing the benefit of the suggested labelling and requiring considerably more writing.
- (c) This sought the greatest possible medal total, which required noticing that only three teams in any event get medals. Almost all candidates responded, but only a third gave the correct answer, despite this deduction being straightforward. Better responses took account of this constraint.
- (d)(i) The rest of the question considered the cases where we are told there are 7 gold medals but not what they were for. The first part asks for three ways in which this can happen. A quarter of candidates offered no response, and a few only offered one or two.

- (ii) The calculation of the maximum number of silver medals for the squad required noticing that those who gained gold would not get silver. A third of candidates offered no response, and many of the responses simply assumed that if they had 7 gold then 7 was as many medals as could be obtained.
- (e) This sought the lowest maximum of the possible cases, and called for careful counting. A third of candidates offered no response.

Question 2

Different costs in two countries as well as a varying exchange rate can require an allowance to supplement salaries. Different ways to calculate an allowance are explored, along with the consequences of changes in the good use for comparison. Better responses made clear what differences or ratios were being discussed, and which currency was considered.

- (a) A total price for a basket of goods using the cheapest source for each was called for. This involved taking the smallest number on each row from the relevant three columns.
- (b) This looked at average prices, and called for the median price of each item to be determined and the total of all items in the basket calculated. Few candidates used the median, and many of those either took the median of the totals or the median of all the prices rather than the median for each item (all of which are the same for the mean).
- (c) This looked at the impact of 'loss-leaders' (although that term was not used). Some candidates used a laborious 'try everything' approach instead of calculating the cost for each supermarket and then identifying the single case that matched the difference.
- (d) This considered the impact of changes under different scenarios on how the allowance could be calculated: as an absolute difference or as a ratio. Twice as many candidates did not attempt the ratio than did not respond to the difference. A few worked out the correct figures but then, with lack of words identifying the numbers, applied them the wrong way around.
- (e) The direction of change when one parameter was decreased was asked for; few responses gave a correct direct answer.
- (f) This explored the impact on the spending power on staff when the exchange rate changed so that no allowance was needed. No calculations were needed, but there was no response from a quarter of candidates.

Question 3

Given constraints on room size, times and costs, this question looked at options for parties. The lowest rate for a given model giving a specified profit was wanted. Candidates needed to be clear what was a cost for the organiser and what was income (and cost to someone else).

- (a) The minimum price for a given party for a specified time and number of guests involved determining the cheaper of the options that could accommodate the number of guests. All candidates answered and almost all gave the correct answer.
- (b) This involved taking the difference between Alice's income and her costs in a specific case and correctly identifying whether it was a profit or a loss. Better responses included all the costs. A few just gave a number and did not make it clear whether it was a profit or a loss.
- (c) The minimum number of guests to make a profit was asked for. Many candidates gave the profit (in dollars) rather than the number of guests. Some looked only at the minimum numbers for the rooms where these were specified and ignored the case where there was no minimum.
- (d)(i) Many candidates ignored the constraint that parties were between 2 and 5 hours. Nobody guessed the wrong end.
 - (ii) Some candidates used algebra, but made difficulty for themselves by using $(\text{income} - \text{cost})/\text{cost} > 20\%$ rather than a simpler formulation.

- (e) This part wanted what was identified as a reduced rate. Candidates who offered an *increased* rate could have checked this. Some sought to reduce the profit by 5% rather than add 5% to costs. It was necessary to consider the 30 guests at full price as distinct from the 20 guests at a reduced price, and few made the distinction. A quarter offered no response.

Question 4

A competition with a curious scoring method was presented, along with incomplete tables of scores. Since scores with halves and quarters were involved, premature rounding caused errors.

- (a) The theoretical maximum score that could be obtained in a round was required. Some candidates would have benefited from noticing that some of the actual scores were greater than their suggested maximum.
- (b)(i) Full marks required correctly determining the original total, adding 2×3 , and applying the penalty for contestants making a second attempt. Some candidates noticed that their responses involved more than the maximum but did not deduce that they had made a mistake.
- (ii) The score from the first attempt was easier to calculate as it had no addition and no penalty; most candidates calculated this correctly.
- (c)(i) This involved finding the three cases which were multiples of 2.5. Most responses included the two obvious cases (with 0.5).
- (ii) A second attempt by a contestant would involve a 5-point penalty. One of the scores was not a multiple of 3 nor of 2.5. Most responses were based on this, but some correctly observed that the rate was above 2.5 in the relevant case, and so must be 3 with penalty.
- (d) A third of candidates offered no response to this part, and many candidates addressed a different and easier question: why the individual judge's scores could not be determined from the total. It was sufficient to note that both 2.5 and 3 are factors of 45. Some candidates wasted time exploring other divisors without taking account of the limit of $3 \times 8 = 24$ on the multiplier. Many of those candidates who scored well on other questions did not gain this mark, possibly attempting a short-cut (but leaving no evidence of their reasoning).
- (e) The grand total involved more than adding three scores for tricks in a table; half of an earlier score was needed, but only about half of the candidates took this into account.
- (f)(i) The instruction was 'show that at least 2....' so for both marks it was necessary to show that 1 was not sufficient. Many responses only offered how it could be done with three, and a few used more. One third of candidates did not attempt this part.
- (ii) This involved finding the highest score that had been or could still be obtained by other contestants, not just the one mentioned in (f)(i), and comparing with Cuthbert's. Better responses looked at the general case and not the specific one explored in the previous part.

THINKING SKILLS

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

- In **Question 1** many candidates wrote longer answers than needed.
- In **Question 2** many candidates are paraphrasing the argument elements or evaluating the argument. Marks are awarded only for precise identification of argument elements.
- In **Question 3** many candidates are still attempting the wrong task. They are asked to evaluate the reasoning, not to argue against it or to write their own opinions on the topic. Study of previous mark schemes should reveal the kinds of answers that are credited.
- In **Question 4**, candidates can only achieve the highest marks if they engage critically with the documents provided.

General comments

Most candidates appeared to have enough time to finish the paper. Those who appeared to be rushing on **Question 4** had often spent a long time on **Questions 1** or **3**, achieving very few marks, where marks would have been achieved more easily on **Question 4**. In previous reports it has been noted that more candidates were writing answers whose length reflected the mark allocation more closely. Unfortunately, this trend has not continued this session and many candidates were writing responses to **Questions 1, 3** and, to a lesser extent, **2** that were too long.

The standard of candidates varied but there was evidence that many candidates had not been well prepared. Many did not know what they were being asked to do, particularly in **Questions 2** and **3**.

Comments on specific questions

Question 1

Almost all candidates attempted to criticise the data or the inferences drawn from it. Most achieved 1 or 2 marks but some achieved more. The most commonly seen creditworthy response was to mention that SSRIs are used to treat conditions other than depression. Most other points on the mark scheme were seen and credited but less frequently. The only point examiners did not see was discussion about the ambiguity of the term 'sales'. The passage referred to a large-scale study so responses that questioned the sample size were not credited. Some candidates misinterpreted the passage and inferred that the increase in depression was within the group of celebrities only. As ever, some responses discussed the lack of a source or sources given and achieved no credit.

Question 2

This question rewarded the well-prepared candidate. Those who knew what was expected and attempted an analysis of the argument usually gained at least half the marks, and often more, easily. However, many candidates provided a non-creditworthy summary or gist. Some seemed unaware that quoting from the text is an appropriate, indeed a required, way to answer this question. A small minority attempted to evaluate the reasoning, which they were invited to do in **Question 3**.

Question 3

The better prepared candidates attempted to evaluate the passage, but many are still listing a series of counter-arguments to points in the passage. Most candidates who did attempt to apply their evaluation skills struggled to gain more than 2 marks. The most frequently credited weaknesses identified were weak analogy

between tobacco company claims and GMO manufacturer claims and, to a lesser extent, the appeal to ignorance in paragraph 4 and the *non-sequitur* in paragraph 5. A few, usually high-scoring, candidates understood what an assumption was and were able to identify several. Most candidates, however, appeared to regard any unsubstantiated claim as an assumption. Many candidates offered counters to the claims in the passage. This was not credited.

Question 4

Candidates were required to use the documents and their own ideas to construct a reasoned case to support or challenge the conclusion that we should encourage the development of GM foods. Most candidates did focus their entire argument on supporting or challenging the conclusion – the majority being in support. Fewer candidates than in previous sessions considered both sides equally and then decided on a conclusion at the last minute. In responses that adopted this latter approach it was difficult to award higher level marks in both the structure and quality skill sections.

The majority of candidates scored below 12 marks because their reasons rarely went beyond what was written in the documents and the information given in the documents was used uncritically. A minority of candidates were able to produce a thoughtful and reasoned case that achieved higher marks. It was pleasing to see some candidates attempt to structure their arguments using strands of reasoning and intermediate conclusions and only a very few failed to state any conclusion at all. A small number of candidates simply described the contribution made by each document to the debate. As stated in previous reports, what is likely to get high marks is a persuasive argument with a clear structure that is supported by thoughtful, particularly critical, use of the documents and that thoughtfully considers and refutes relevant alternative viewpoints.